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THE UNKNOWN DETERMINING FACTORS IN DISEASES OF THE NERVOUS SYSTEM *

EDWIN G. ZABRISKIE, M.D.

NEW YORK

Our knowledge of the etiology and the pathogenesis of disease processes is steadily advancing, thanks to the constant accessions of new workers in laboratories throughout the world; and tremendous strides are being constantly made in the advancement of our knowledge of the physical and chemical forces at work in living organisms. As the questions about which fierce controversies raged—it seems only a few years ago—are answered, other questions present themselves with a new significance, in an entirely different light, are just as puzzling, demand even greater concentration of thought, and appear to hold out the same elusive will-o'-the-wisp promise of solution that formerly mocked us in problems which at present no longer exist.

It seems only a short while ago when arguments pro and con were being hurled back and forth over the possibility of tabes and paresis without syphilis. When Erb, Fournier and a few others fought with almost fanatical zeal, it seemed against a world of doubters, timid conservatives and controversial opponents, for the dictum that without syphilis one could not have tabes or paresis. Yet who today, since the Wassermann reaction has given positive proof of this statement, ventures to question its validity? We now think in terms of neurosyphilis, we speak of its various subdivisions, and our primary therapeutic attack is against *Spirochaeta pallida*. All else in the plan of therapy is secondary and is either supportive or corrective. We have now turned to the problems of why only a certain percentage of those exposed develop neurosyphilis, whether or not there are different strains of the spirochete which cause neurotropic or dermotropic lesions according to the strain; why neurosyphilitic lesions usually appear so long after a primary infection, or why a definite percentage of those carrying spirochetes from the prenatal state fail to pass the stormy period of adolescence without destructive lesions of the nervous system.

In like manner, most of the types of pyogenic or virus infections of the central nervous system and its envelops have been identified, and are quite firmly established either clinically or by the micro-organism. We now distinguish confidently between virus infections and bacterial infections, thanks to the splendid work of the bacteriologic and immunologic laboratories. Our plan of therapy is rapidly determined for us by the laboratory examination, and our success in this field alone more than justifies all the energy, time and thought that have been expended. We may feel a degree of confidence in treating certain of the forms of meningeal infections, and we may be just as helpless as ever, when confronted with other forms; but at least we know our power and our limitations much better than ever before. On the other hand, the fear of epidemic outbreaks is always with us, and in our constantly increasing massed population among all the overcrowded living conditions this implies, the danger appears increasingly greater. To be sure, we have learned a great deal about the modes of transmission of these organisms or viruses, and the importance of contacts, but still the questions remain unanswered why mere exposure alone is in most instances insufficient to produce the disease; why in the midst of a house full of persons only a few are stricken; why certain districts isolated practically from the rest of the world are attacked; why certain of the virus infections are at times epidemic and at other times pandemic; or why certain individuals may withstand a local infection successfully until subjected to some other influence and then succumb to a generalized invasion of the same organism which becomes fulminating in its virulence.

An epidemic of poliomyelitis in one of the Swiss children's hospitals, occurring a short time ago, illustrates quite well my meaning. Here several cases in different wards appeared spontaneously. Only a comparatively small number of children, i. e., two or three in each room, developed the disease. The beds were so situated that direct contact from patient to patient was out of the question; the utensils and clothing were cared for in a perfectly competent manner, and after the first case developed, proper quarantine measures of the strictest sort were established and maintained. Suspicion finally centered on one nurse, and it was definitely established that in one capacity or another she had actually handled each of the children affected, although she had handled many more who developed no symptoms at all.

Assuming, then, and the evidence is fairly conclusive in this respect, that this particular nurse was the actual carrier of the virus, we are confronted with the fact that although many children of different ages in separate wards came in contact with the carrier, only a relatively small number contracted the disease. It is of further significance that all the children who contracted the disease were under treatment for conditions of the most dissimilar nature, which could not be classified in a definite group or groups.

The occurrence of epidemic encephalitis is also subject to certain determining factors, the nature of which is still obscure. Even the so-called microbic etiologic agent is unknown, and although its epidemic incidence

* Chairman's address, read before the Section on Nervous and Mental Diseases at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

leaves little doubt of the existence of such an agent, and while the consensus of opinion is for the separation of encephalitis from influenza, or, in other words, that these diseases are caused by different micro-organisms, one must recall that until quite recently one was regarded as a sequel of the other. Furthermore, the significance of the appearance of practically a new disease, following closely in the wake of one of the most devastating influenza pandemics the world has ever seen, is too important to be ignored. The history of encephalitis preceded, not immediately, but some time before, by an attack of influenza, or what at the time was considered to be mild grip infection, differing from an ordinary cold principally in the degree of prostration following recovery, is altogether too frequent to be of no importance, and, as Flexner says, "Whether an attack of the first acts to predispose to an attack of the second in the manner of the predisposing effect of influenza on bacterial affections of the respiratory tract is a question awaiting close study."

PYOGENIC INFECTIONS

The pyogenic infections of the central nervous system, at least in many instances, appear to present the same problems of determination, and here again we find the human organism capable of withstanding or holding in check the onslaught of the attacking forces until a new factor appears, the resistance breaks down, and the host is overwhelmed.

An illustration of this was the case of a middle aged man who underwent a radical mastoid operation. Not only the mastoid was affected but the labyrinth as well, and the operator was in doubt about interfering with this complicated organ for reasons that are obvious. It was decided to leave it alone, and results seemed to justify this decision, because he made a good recovery. That is to say, he recovered from the operation, the wound healed, and although the discharge from the ear continued—the result, of course, of granulations in its labyrinth—this steadily diminished in amount and the signs of labyrinth irritation became less annoying. He continued to progress in a satisfactory manner for eight months, at the expiration of which he acquired a mild so-called grip lasting only a few days. Four or five days after this, without any recognizable premonitory warning, he was seized in the middle of the night with a violent headache. The following day he lapsed rapidly into a comatose state with all the signs of acute meningitis, and within twenty-four hours he had succumbed to a virulent septic meningitis.

Another case is that of a boy, aged 17, who submitted to a submucous resection of the septum. The field of operation was unfortunately infected, and during his stay in the hospital he suddenly developed intense frontal headache, vomiting, photophobia and moderate papilledema. Of course, brain abscess was suspected from the first, but during the course of observation all signs gradually disappeared and he was discharged cured. It was thought that the first suspicion had been incorrect and that a localized serous meningitis was the cause of the condition. However, exactly one year from the date of these signs, he ate a large quantity of indigestible food, went to bed, and awoke in the middle of the night with violent frontal headache, and soon after began to vomit. Within twelve hours he became unconscious and died after forty-eight hours of almost continuously succeeding convulsions. The necropsy disclosed an abscess the size of a cherry situated in the right frontal lobe containing thick dark yellow pus. It had not ruptured, although the capsule was very thin, but the surrounding brain tissue for at least 4 cm. in all directions was the seat of an intense hemorrhagic inflammation, and both frontal lobes showed an intense hemorrhagic septomeningitis.

Instances similar to these two cases might be multiplied many times over, but they serve quite well to illustrate the fact that the human body may act as host to pathogenic micro-organisms for a long period of time without apparently affecting the health of the patient until some new element appears to overthrow what might be called the resistance equilibrium. After this has occurred, resistance rapidly breaks down, and the invading bacteria overwhelm their victim.

CHRONIC INTOXICATIONS OF NONINFECTIOUS ORIGIN

If one turns to chronic intoxications of noninfectious origin, an interesting condition is met in the fact that alcoholism of the chronic type rarely, if ever, assumes the form of acute intoxication of the nervous system, whether it be central or peripheral, without an additional factor. In other words, a long period of steady consumption of alcohol is of itself incapable of causing acute delirium or polyneuritis. As Bumke, in Lewandowsky's Hand Book, says, "The explanation of why a drinker after years of excess, maybe ten years or more, suddenly is seized with delirium is not to be sought for in the pathologic changes of the brain structure." He is convinced that there are sufficient indications of a so-called intermediate poison which actually occasions the delirium, and quotes Bonhoeffer's observations on the high incidence of these psychoses during the months from March to September, which may be attributed to temperature changes, since the oxidation of alcohol takes a longer time in warmer weather than in colder. Bumke is also inclined to attribute great importance to acute infections in the development of the delirium, although neither he nor Bonhoeffer is quite clear whether they are to be regarded as complications or something of a more determining character.

Other factors may also contribute to the steadily augmenting unstable state of the chronic drinker; namely, toxins emanating from a long standing disturbance of the digestive system, or a gradually increased interference with the proper eliminating capacity of the liver, because of chronic interstitial changes in that organ. Indeed, Wagner von Jauregg believes that these factors are most significant in the determination of the delirium.

This peculiar feature is not operative merely in alcoholic deliria, but is common in the polyneuritis group as well. For instance, an emotionally unstable woman, aged 38, who had always been most temperate in her use of alcohol, began to increase her consumption immediately after the death of her husband, so that for the past three years she drank about a quart of gin between the hours of 11 p. m. and 2 a. m. She was never badly intoxicated, never drank in the day time and was always well able, not only to do her work on the stage quite capably, but managed to increase her income by writing short stories, for which she always found a willing publisher. Last summer after a fatiguing transcontinental trip, for two weeks she worked double time on the Pacific Coast and then took ship for Australia, where she was seized with an attack of influenza and had a low temperature for a few days. After an apparent recovery had set in she became confused, irritable, noisy and within a few days developed a mild delirium tremens, from which she gradually emerged in the grip of a perfectly classic alcoholic polyneuritis which affected all four extremities and all the muscles of the back. It is of interest to relate that, as she recovered, the order of recovery in all four extremities was the same. The distal portions of the limbs regained strength and tone before the proximal, especially in the lower extremities, where movements of the

feet and Achilles jerks recovered more rapidly than the quadriceps extensors and the knee jerks, thus exhibiting in this respect at least a certain similarity to this well known feature of infectious radiculitis, or neuronitis, as Foster Kennedy calls it. The possibility of Australian X disease was also considered, but it was discarded for reasons that at present need not be discussed. The important facts are that this woman drank to excess for several years without limiting her mental or physical capacity until, after several weeks of excessive fatigue, a long sea voyage during which heavy drinking occurred, and a fairly severe grip infection, she suddenly exploded, as it were, with an acute alcoholic intoxication of the brain and peripheral nerves. It might also be said that, except for a rather severe colitis, no impairment of the other visceral organs could be detected.

TRAUMA

It is necessary at this point to consider trauma as a possible causative factor, not only in alcoholic intoxications of the nervous system but in other diseases of the nervous system as well, notably multiple sclerosis. Just as formerly, there is today a considerable difference of opinion in the case of alcoholic deliria, whether the evidences of head injuries so frequently found constitute the result of an already developing confusional state or occur before this has begun and therefore are to be considered as causative. There is little doubt that the latter may also be true, for the history of antecedent brawls, or fights accompanied by blows or other injuries not always on the head but frequently over the abdomen, is encountered too often to be ignored.

The anamnesis of multiple sclerosis likewise furnishes us with many instances of the rapid onset of the disease after fairly severe jarring blows to the spine, the immediate effects of which were soon recovered from.

A case in point is that of a healthy girl, aged 18, who, while attempting a difficult dive from a height of about 6 or 7 feet, made a misstep and landed flat on her back on the surface of the water. Although she was severely jarred, she felt no other ill effects until a few days later, when the first symptoms of multiple sclerosis appeared. In a short time the condition developed to an extensive degree and she became quite helpless.

There are many other instances similar to those I have enumerated which might serve to demonstrate the existence of factors which set in play pathogenic forces that have been hitherto latent in the body of man. These will serve our purpose for the present, however, and furnish more than sufficient material for a glimpse at the possible nature of these factors.

FACTORS IN LATE CONGENITAL SYPHILIS

About two years ago, I presented before this section a consideration of certain factors that might be of importance in the development of the lesions of the nervous system in late congenital syphilis. Among other possible factors, the relation of the lipoids to proteins during growth, the proportion of lipoids in nervous tissue during the early stages of medullation, variations of lipoids during disease states, and their sundry behavior during the experimental protein intoxication of Pfeiffer were discussed. Reference was made to Pfeiffer's theory that the lipoids which disappear from the suprarenal cortex during acute intoxication are mobilized in the blood for the purpose of neutralizing the proteolytic enzymes set free by the primary intoxication, and the indications of a possible connection between these two substances and syphilitic changes in the body were pointed out. The relation of the Wassermann reaction to lipoids, and the nature of Neisser's reagin, which Kolmer believes is the product of the cells of all tissues, and possesses the capacity of combining with lipoid substances, although its actual composition is still unknown, were also referred to.

In connection with this, I will refer to the interesting work of Güter, Lowenstein and Segrist, Doer and others on the properties of herpetic virus, especially their more recent researches; because they may eventually have some bearing on the situation.

Flexner indicates clearly in his article on epidemic encephalitis the striking similarity in the behavior of herpetic virus to that of encephalitis produced experimentally in certain laboratories in France and the United States. He relates Lowenstein's identification of all forms of febrile herpes as distinct from herpes zoster, and his conviction that the active material of the febrile herpetic eruption must have a wide distribution in the healthy body since it so readily accumulates and multiplies in the eruptions and the inoculability of the virus, no matter what the inciting cause, whether it be febrile disease, a drug (arsphenamin) or a foreign protein (milk injection).

Then follows the observation by Doer, somewhat later, that rabbits inoculated by the corneal route with herpetic virus frequently develop symptoms that are identical with experimentally produced encephalitis, thereby adding weight to the conviction that herpes is a generalized pathologic state and not a mere local condition.

Flexner also reports a case which is perhaps more important than anything else in the article since it indicates the possibilities of active material in the human body which without evidence of its existence is capable of producing pathologic states in animals and can be transmitted from generation to generation. The case is that of a patient treated for neurovascular and cardiovascular syphilis acquired sixteen years previously. He was under treatment at the time with mercury and arsphenamin and had had no signs or symptoms of encephalitis, or herpes of any type. The spinal fluid of this man gave a strong globulin reaction, was sterile to ordinary culture methods, and was injected intracerebrally into two rabbits, one of which died ten days later with symptoms of encephalitis. This virus, as Flexner calls it, was effective no matter how inoculated, for whether it was introduced subdurally, through the cornea, through the nares or the blood or the testes, the inoculated animal always showed symptoms of general encephalitis.

At the time of publication this strain had been carried through twelve generations of unimpaired activity, although it is interesting to note that, a month later, fluid from the same man gave reactions of a much milder type, and all the animals three months afterward were susceptible to inoculation with herpes virus. This was the only case of its kind from more than 200 fluids, more than forty of which were epidemic encephalitis cases; and although it served no particular purpose in that investigation, still one is forced to consider its value as indicative of the actual existence of active material in the human body, which, without betraying itself in any way, is capable of reproducing its effects through many generations, and which is not permanent but may lose these qualities after the expiration of a month.

One seeks the explanation of this interesting observation among several theoretical possibilities. Can the presence of arsphenamin in the cerebrospinal axis of a person with syphilis produce a lipase or similar ferment which is thrown in the spinal fluid and is capable of producing these lesions? Has a condition similar to herpes caused by arsphenamin or a split protein intoxication arisen either as a result of treatment or from the action of the syphilitic virus, producing the same active material in the fluid that is found in the vesicles of ordinary peripheral herpes? Unfortunately, there is nothing in the report of the case which might indicate this either by a violent reaction against arsphenamin during the inauguration of treatment or a later sensitization to the drug. Finally, was the fluid obtained during a phase of mild infection by some of the filtrable organisms of Olitzky and Gates, in which the severity of the infection was inhibited by the immunizing capacity of the host, by the activity of the syphilitic infection or by the presence of mercury and arsenic in the body of the host?

ELECTRODYNAMIC FORCES

The recent developments in the study of the colloids and the foundation of more exact laws governing their behavior gives promise of the solution of many problems that are still obscure. The importance of the simpler methods for the determination of hydrogen ion concentrations, the confirmation of Jacques Loeb's theory of proteins and Donan's law of equilibrium, which enabled the formulation of a mathematical expression to account for the colloidal behavior of proteins, has been recently very well summarized by Robert Loeb in an address before the New York Academy of Medicine.

From his summary of the present status of this branch of science, it at once becomes evident that the more our knowledge advances in this direction the nearer we come to an understanding of the importance of electrodynamic forces in the regulation of the phenomena of life and disease processes. Three of the most important observations bear directly on this subject. They are the studies in enzyme action by Northrop; the properties of agglutination by de Kruif and Northrop, and Shibley; and the body water balance studies by Palmer, Atchley, Loeb, Van Slyke and others. In the first instance it has been shown that the action of both pepsin and trypsin is probably an ionized protein alone and that whether the protein is in solution or precipitated makes no difference. Furthermore, that the apparent variations in its action are really governed by Donan's law of equilibrium.

The study of the stability of bacterial suspensions by de Kruif and Northrop has demonstrated the existence of two antagonistic forces called repelling and cohesive forces, and that these forces operate according to the potential of the solution and the sensitization of the bacteria. Shibley, working along the same line with streptococci, has shown that immune agglutinating serums possess a specific charge-reducing substance which is quantitatively related to the agglutination titers of the serum, and that in absorption experiments this substance is lost.

In the study of the water balance of the body, two important facts have been determined: 1. In cases of edema, an equilibrium exists between the serum and the edema fluid which in all likelihood is the same as that described by Donan. 2. In the blood, distribution of electrolytes between cells and serum can be predicted by mathematical expressions derived from three laws governing dilute solutions.

The relation of the sympathetic nervous system to these factors is still very obscure. Our present knowledge of the manner in which it regulates the various vegetative and biochemical processes and its relation to the electrodynamic forces of these phenomena barely approaches the threshold of the problem. We know that the electrical conductivity of nonmedullated fibers differs greatly from the medullated, and that electrical currents travel at a much slower rate over the former than the latter. We also know that the response obtained over the medullated fibers from skeletal muscles will fatigue much more rapidly than the responses obtained from organs supplied by the sympathetic. But whether this results from the electrolytic resistance of the cell membrane or the possible colloidal fixation of certain ions on the calcium content of the cells is still in the dark. That the sympathetic may play an important rôle in the production of substances that act as enzymes, that can influence the equilibrium of the colloidal matter or that can act in a pharmacodynamic capacity seems fairly certain of proof in the near future. At all events, the last named feature has been demonstrated by Le Heux, who first proved the stimulating effect of cholin on intestinal peristalsis and then caused the formation of cholin by stimulation of the vagus. Löwi also obtained substances through stimulation of the vagus which had a direct action on heart muscle deprived of nerve influence. It is also difficult to explain the pharmacodynamic action of posterior lobe pituitary substances when injected into the leg of an animal, after the blood supply to the part had been completely cut off, on any other basis than through the sympathetic nervous system. In like manner, the instantaneous respiratory response of a man in coma with Cheyne-Stokes respiration must be explained. This interesting phenomenon was observed in a case of epidemic (lethargic) encephalitis with marked Cheyne-Stokes breathing in which the application of carbon dioxid gas to the nasal mucous membrane during the quiet interval was instantly followed by resumption of the respiratory act in a time too short to permit the transport of the carbon dioxid molecules by the blood stream to the respiratory centers.

CONCLUSION

I have attempted to indicate the existence of a hitherto undetermined factor in certain diseases of the nervous system which in reality furnishes the means whereby the resisting capacity of the organism to pathologic forces is broken down, and the destructive power of these forces, whether focal or general, are given free rein.

All our evidence at the present time seems to point to further research in the field of electrodynamics, to which colloidal chemistry and nerve action unquestionably belong. It is the field toward which Jonathan Wright, more particularly as regards tonsil infection, has been inviting our attention for many years; and in my opinion holds the solution to many, if not all, the problems indicated in this address.

Whether the sympathetic nervous system exercises more than a conducting function or whether it has actual dynamic function in these conditions remains to be demonstrated, but I am confident that future research will prove the supreme importance of this structure in the operation of these determining factors.

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HELIOTHERAPY, WITH ESPECIAL REFERENCE TO SPINAL TUBERCULOSIS *

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The use of sunlight in the treatment of chronic diseases is as old as the study of medicine. The specific action of heliotherapy on deep seated tuberculous lesions was first emphasized by the Lyons school of surgeons in France. Their treatment consisted for the most part in exposure of the diseased area alone, although a few of the teachers recommended general, as well as local heliotherapy. In 1903, Rollier opened, in Leysin, Switzerland, the first clinic for the systematic application of the sun bath to the entire surface of the body, in the treatment of extrapulmonary tuberculosis. During the last fifteen years, heliotherapy has spread rapidly, and in our own country, a number of clinics are employing a more or less modified form of this treatment.

The use of the sun bath as a therapeutic agent in the treatment of extrapulmonary tuberculosis is based on the recognition of the fact that tuberculosis, wherever situated, is a general disease presenting local manifestations, and as such demands treatment directed toward the improvement of the general health. Prolonged rest in bed, fresh air, sunshine, good food and the best possible hygienic surroundings are the recognized mainstays in the treatment of pulmonary tuberculosis—a therapy intended to raise the resistance of the patient by building up the general constitution.

Advocates of heliotherapy feel that these reconstructive methods are of equal importance in the care of extrapulmonary tuberculosis. If, in addition to these measures, the entire body is gradually and systematically exposed to the sun and air, preferably at a high altitude, the stimulating, upbuilding effect of this combination is of the greatest therapeutic value. The body is thus placed in its most natural surroundings in an environment that will give it the best chance to combat infection.

The action of the sun's rays can receive only a part of the credit for the results obtained in these cases. Rest, fresh air, food, and the maintenance of immobilization and correction of deformity when present, by appropriate means, must be taken into consideration as well. Just what the relative values of these different factors amount to is difficult to determine.

Prolonged rest in bed, not for a few weeks but for months, or even years, is an essential feature of this treatment. Patients, unfortunately, have not been taught that this long period of physical inactivity is necessary, but have rather been encouraged to seek a short cut to a cure by resorting to more radical measures.

Rollier teaches, however, that the time is well invested, since, at the end of the treatment, not only the lesion itself is healed, and with a good functional result in the majority of cases, but the general condition of the patient has been tremendously improved, and this is the important thing on which he must depend for the prevention of relapse.

The action of sunlight on metabolism has not been definitely explained. Rollier says, "We know that a large number of vital reactions are accelerated and suppose this increased rate to be in some way connected with the absorption of radiant energy by the blood."

Sonne, of the Finsen Institute, has shown that the blood may be heated many degrees above the normal body temperature by the luminous rays of the sun, and he feels that this continued heating of the blood is responsible for numerous changes in metabolism. Rosselet, writing on the scientific basis of heliotherapy, draws the following conclusions concerning the action of sunlight on the body:

> The direct action of light on a deep seated tuberculous lesion has neither been proved nor disproved; it would therefore be a mistake if, in the present state of our knowledge, it were to be denied categorically. The indirect action is well founded on fact. Light absorbed by the skin gives rise to numerous and useful reflexes; absorbed by the blood, the energy given out by the radiations is stored and carried by the blood stream to every part of the body; when liberated, it stimulates the intracellular processes of oxidation and reduction. This condition is the probable explanation of the increased metabolism of the body, of the improvement of the general health, of the increased resistance to disease both present and threatened.

In some way, not yet adequately explained, heliotherapy has a profound influence on calcium metabolism, as has been so well demonstrated by Hess [1] and others in this country.

TECHNIC OF HELIOTHERAPY

The following descriptions of the general technic of heliotherapy, and the treatment of spinal tuberculosis, are based on a personal study of the methods employed in the Rollier clinics and the literature of Rollier [2] and his co-workers.

Before the patient is exposed to the sun, he is put to bed at complete rest until he becomes accustomed to his new surroundings, the change of altitude, temperature, etc. This is usually accomplished within a few days. After the patient has been gradually trained to remain in the open air day and night, the body is first exposed to the air, a little more each day, but not to the sun. This preliminary fresh air treatment should always be given. Too much emphasis cannot be placed on the two essential principles that constitute the basis of the properly applied sun bath. They are: (1) strict individualization, and (2) careful progression. An average dose of sunlight in the beginning may cause vertigo, headache or nervousness in one patient, and simply a feeling of comfort in another. The skin of one patient may burn, while that of another will show no change of color. Dark persons react more favorably toward sunlight than do the fair. The sun bath must be applied gradually, and the time of exposure increased slowly. It must be regulated according to the subjective and objective reactions of the individual. Short periods of insolation alternating with periods of rest enable the patient to tolerate more sunlight than is possible with one long sun bath.

The following schedule is employed in an average case:

The first day, the feet and ankles are exposed for five minutes, three times, interrupted by two ten minute intervals.

The second day, the feet and ankles are exposed for ten minutes, and the legs to the knees are exposed for

* Read before the Section on Pharmacology and Therapeutics at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

1. Hess, A. F.: The Ultraviolet Rays of the Sun, J. A. M. A. **84**: 1033 (April 4) 1925.
2. Rollier, A.: La cure de soleil, 1915; Heliotherapy, Oxford University Press, 1923; The Practice of Sun-Cure for Surgical Cases of Tuberculosis and Its Clinical Results, XVII International Congress of Medicine, London, August, 1913.

the last five minutes of this period. This procedure is repeated three times at ten minute intervals.

The third day, the feet and ankles are exposed for fifteen minutes; the legs for ten minutes and the thighs for five minutes, three times with two ten minute periods of rest.

Next the abdomen and then the thorax are similarly exposed. Thereafter using increments of five minutes, this plan is followed until about the fifteenth day, after which the entire body is insolated from the beginning of the bath.

The maximal duration of exposure varies from three to six hours. This is not a hard and fast schedule, but must be varied according to idiosyncrasies and reactions.

When conditions, such as the location of the lesion or its state of healing, permit, the patient is turned to the ventral position, so that the posterior surface of the body may be exposed according to the same plan as outlined for the anterior. The head should not be exposed and the eyes should be protected by smoked glasses.

SPINAL TUBERCULOSIS

A patient suffering from spinal Pott's disease is immobilized at once in the dorsal position, on a hard mattress, over a bed frame which does not sag. After the preliminary fresh air treatment has been given, the sun baths are begun and carried out according to the plan previously described. Restless patients are more completely immobilized by a canvas jacket which buckles over the chest and is firmly fixed to the bed by straps. Knee straps may also be necessary in some cases. The jacket is opened when the chest is insolated.

If the patient is considerably undernourished, even though no deformity is present, the back is protected by several small cushions packed with millet husk. These are firm and act as excellent supports for the normal curvature of the spine. Other cushions are then placed directly under the diseased area, in order to maintain and increase lordosis, and reduce the compression of the vertebral column at the site of the disease. For this purpose, there are used, first, a pad filled with millet husk, then one filled with sand, and finally a wooden block, covered with canvas. The thickness of this support is gradually increased as improvement takes place.

When muscular contraction and pain have disappeared and when roentgen-ray examination shows that recalcification of the bone is taking place, the patient is turned to the ventral position during a part of the sun bath each day.

A triangular, wedge shaped cushion is then placed beneath the chest in order to maintain lordosis. This, too, is gradually increased in thickness. According to Rollier, the following are the chief advantages of the ventral position: "1. By increasing lordosis it reduces pressure on the vertebral bodies. 2. For the same reason it diminishes kyphosis. 3. It facilitates digestion. 4. It permits the direct insolation of the back which, incidentally, greatly improves the condition of the skin and prevents bedsores. 5. It encourages the development of the back muscles."

Development of the back muscles is one of the most important features of this treatment. Under the influence of insolation, they undergo marked hypertrophy and come to act as an admirable support or corset, which plays a major part in the prevention of relapses.

When kyphos is present, it is gradually overcome by the increasing height of the support, which is placed directly under the deformity, as previously described.

The correction of deformity is accomplished chiefly by the development of a compensatory lordosis on each side of the lesion. The normal elasticity of the spinal column, above and below the lesion, permits the kyphos to be pushed in gradually. The end-result sought for the ultimate cure of this disease is the formation of a solid block of bone embracing the vertebrae originally involved.

Abscess, if present, should never be incised, on account of the danger of introducing secondary infection. An abscess should not even be aspirated unless it threatens to rupture. When aspiration is necessary, the needle should be passed through healthy tissue and must under no circumstances be introduced near the point of threatened rupture. As a rule nothing is injected into the abscess cavity, and a pressure bandage is applied following aspiration.

When cervical vertebrae are diseased, extension of the vertebral column should accompany immobilization.

No patient with spinal tuberculosis should be allowed to get up until all symptoms and signs of the disease have disappeared, and until roentgen-ray examination indicates that new bone formation has taken place to a sufficient extent to prevent further displacement of the diseased vertebrae. This stage should be reached, in an average case, after from twelve to twenty-four months of treatment.

The patient then wears a light corset, either of celluloid or of some softer material with firm supports, for about six months. A less rigid corset is then worn for an additional six months, and patients are advised to continue their sun baths at home whenever possible.

PROGNOSIS

When sun treatment is conscientiously and intelligently carried out under suitable climatic conditions, the prognosis in these cases is most favorable. One hundred and ninety-eight cases of spinal Pott's disease were treated in Leysin, from 1903 to 1913. Eighty-six per cent. were cured and 12 per cent. were improved. There were two relapses and four deaths. It must be remembered, of course, that these cases were cared for by an experienced heliotherapist, working under almost ideal conditions. In cases complicated by abscess formation, in which secondary infection has taken place, while the chances of ultimate recovery are always good, the duration of treatment will naturally be prolonged.

INDICATIONS AND CONTRAINDICATIONS FOR HELIOTHERAPY

Sunlight is a potent agent which must be employed with great care. Disastrous results may follow the failure to recognize this fact. It must be emphasized that heliotherapy is in no sense a panacea, however useful it has proved to be in certain diseases.

The principal conditions in which heliotherapy has been shown to be of special value are:

1. Tuberculosis of the bones, joints, glands, skin and serous cavities and with certain modifications, of the lungs.
2. The acute febrile diseases during the stage of convalescence.
3. Rickets.
4. The secondary anemias.
5. Wounds, especially of the sluggish type, and those complicated by chronically discharging sinuses.

6. Fractures, particularly those showing a tendency to nonunion.
7. Osteomyelitis, as an essential part of the postoperative treatment.
8. General debility. This term is used to include that group of persons who are generally below par, but in whom evidences of definite disease are wanting.
9. So-called pretuberculous children.

Heliotherapy is not to be employed in the presence of:

1. Nephritis.
2. High fever with toxemia.
3. Advanced circulatory disease, such as myocarditis, arteriosclerosis and decompensated cardiac disease.
4. Renal tuberculosis when bilateral and showing symptoms of impending uremia.

Heliotherapy should be stopped whenever acute intercurrent infection develops, and should not be resumed until the lapse of several days after the normal temperature has returned.

COMPARISON WITH OTHER METHODS OF TREATMENT

The prime object in the treatment of extrapulmonary tuberculosis is identical with that of the pulmonary form; namely, to bring about permanent healing of the tuberculous lesion or lesions, together with as complete restoration of general health as may be possible.

The employment of heliotherapy fulfils these conditions more completely than does any other plan of treatment. Heliotherapy, in extrapulmonary tuberculosis, is to be preferred to surgical measures on other grounds as well, the chief of which are:

1. The normal articular functions are retained or restored in the majority of cases.
2. Secondary infection, so frequently resulting from surgical intervention, is almost invariably avoided.
3. The results of heliotherapy, so far as the local lesion is concerned, generally render amputations or resections unnecessary.

The use of plaster for the maintenance of immobilization and the correction of deformity deserves merely passing condemnation, since all mechanical requirements can be met by other means, in conjunction with full exposure of the body to the sun.

Immobilization by other methods, such as the Bradford frame, splints, or other mechanical contrivances, and the operations of spinal fusion do not seem to offer any mechanical advantages sufficient to compensate for the loss of the curative value of properly conducted insolation.

It should further be emphasized that none of these other modes of treatment give adequate consideration to the chief object sought, namely, the cure of tuberculosis and the restoration of general health.

In closing, mention must be made of artificial sources of actinic rays, as represented by the mercury vapor and carbon arc lamps.

It is probably true that some of these devices yield larger proportions of ultraviolet radiations than are to be found in natural sunlight.

Proof is wanting, however, to show that the therapeutic value of sunlight depends entirely on these limited rays. On the contrary, the results of exposure to natural sunlight seem to be definitely superior, at least in the conditions here discussed, to those yielded by the ultraviolet rays alone.

This fact suggests, if it does not prove, that other parts of the solar spectrum have therapeutic actions which we can ill afford to do without.

ABSTRACT OF DISCUSSION

DR. G. B. WEBB, Colorado Springs, Colo.: The French mind of prevision, recognized that "of all the flowers, the human flower is that which most needs the sun." Twenty years ago we started our first-born baby sun bathing the legs up to ten minutes a day, little imagining that Hess and others would find heliotherapy to be a prevention of rickets through the increase in calcium metabolism and the setting free of certain vitamins. I continued to advise short sun baths for infants. At that time we were using heliotherapy for children in so-called surgical tuberculosis and for children in the so-called pretuberculosis stage. The technic we employed was the exposure for two minutes on the front of the body and two minutes on the back, increasing a minute each day. The head was protected, as Herodotus had advised in ancient times, and muscle development was noted as it had been by this early observer. I am frequently asked wherein lies the difference in sun bathing at high and low altitudes: 1. At 6,000 feet, 75 per cent. of the total sun energy exists. At sea level, 50 per cent. of the total sun energy exists. 2. At high elevation, there is a regularity of sunshine. The air is not oppressively hot in summer, and in winter the concentration of the sun counteracts the cold atmosphere. 3. The variations in the intensity of solar radiations are less at high altitudes. Dr. Sevier has spoken of the preliminary air baths. These are of value apart from the sun bathing, as first shown by Benjamin Franklin, a victim of a pulmonary complaint, who also first preached the gospel of fresh air. In patients with pulmonary tuberculosis who are afebrile, we begin sun exposures very carefully on the legs and later, after good pigmentation, on the abdomen and back; and, should no reactions occur, the chest may be carefully bathed. It has been shown that even the sun bathing of the feet may cause distant focal reaction, such as reaction in the mesenteric lymph nodes in the case of mesenteric tuberculosis. The reason why persons who bronze the most do the best is not yet explained; the general question of tissue reaction may be involved. There are several theories, none proved. My colleague, Dr. C. H. Boissevain, realizing the deadly effect of light itself on tubercle bacilli, is now attempting to determine whether phosphorescence resulting from radiation may not play some part. There is no doubt that the cheering mental effect of heliotherapy is valuable. It has been well written that "light and laughter synchronize; darkness and despair do likewise." The prolonged rest, as brought out by Dr. Sevier, is the main remedy for restoration of patients. A pulmonary patient needs from one to three years of rest, and the first year should be as complete as possible. The sunning is simply an adjunct to the more important rest; and care must be exercised even in allowing pulmonary patients to sit in the sun. We had one patient who took sun bathing thirteen years ago for cervical adenitis. After a year of sun bathing, the patient developed tuberculosis of the knee. I should like to ask whether Dr. Sevier has experienced a similar incident.

DR. F. C. JOHNSON, New Brunswick, N. J.: Can either of these gentlemen give us at sea level a little more definite program for exposures?

DR. PAUL D. WHITE, Boston: I had the unusual opportunity last summer of visiting the Leysin clinic and seeing where Rollier works. I can testify to the enthusiasm of the patients and physicians there. It appears to be one of the great meccas of the world for physicians, who come by scores from every country.

DR. CHARLES E. SEVIER, Colorado Springs, Colo.: Dr. Rollier's "school in the sun" is one of the most interesting features of his work. In this school, so-called pretuberculous children, as well as those presenting various other conditions, are given a thorough course of sun bathing. Each child is furnished with a portable desk, and classes are conducted outdoors whenever the weather permits. I was very much interested in Dr. Webb's remarks relative to a patient developing a secondary lesion while taking a course of sun treatment. This, of course, may occur. In one of his books, Dr. Rollier mentions the development of pleural effusions in two patients with tuberculosis of the peritoneum—one a boy, aged 13, the other a girl, aged 17. Coincident with the

appearance of the effusions, high temperatures occurred and the sun baths were discontinued temporarily. After a short time, the temperatures receded. Sun baths were then resumed, and both patients were later discharged, cured. With regard to the question of insolation at sea level, I may say that no hard and fast schedule can be laid down for any given altitude. LoGrosso, working at a comparatively low altitude in Perrysburg, N. Y., prescribes much longer intervals of rest between the regular three five-minute periods of insolation. At all altitudes, each patient must be studied carefully and the time of exposure to the sun regulated according to individual reactions. During the middle of the day, especially in summer, extreme care is necessary. Insolation should be practiced only when the air is relatively cool. The sun bath, when accompanied by a hot air bath, becomes a veritable Turkish bath, which is extremely fatiguing and depressing. This, of course, should be avoided.

GASTRIC EXCRETION OF NEUTRAL RED*

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The application of neutral red as a vital stain has been a wide one since its introduction by Ehrlich into medicine. Its use in the study of gastric secretory functions dates from Fuld's [1] work on dogs with Pawlow pouches in 1908, in which he demonstrated its excretion into the pouch, when the dye was instilled into the main stomach. Finkelstein,[2] in 1922, injecting neutral red and other dyes subcutaneously, studied the excretion into Pawlow pouches and substantiated Fuld's earlier observations. Glaessner and Wittgenstein,[3] in 1923, applied this knowledge to the formulation of a "gastric function test," using as their criterion the appearance time of the dye in the stomach after intramuscular injection. Subsequently, publications by Simici and Dumitriu,[4] Koopman,[5] and Carnot and Gaehlinger [6] have emphasized the usefulness of this procedure. The studies reported here aim particularly to consider the clinical usefulness of determining the gastric excretion of this dye.

Glaessner and Wittgenstein,[3] after injecting 4 c.c. of a 1 per cent. solution of neutral red intramuscularly, observed the appearance time in the stomach. The appearance time in normal persons was from twelve to fifteen minutes, in hyperacidity eight minutes or later, in hypo-acidity from twenty-five to forty-five minutes, and in achylia not within ninety minutes. The absence of excretion of the dye in achylia attracted our attention and suggested the advisability of further work, especially in cases associated with this condition.

Our experience with Glaessner and Wittgenstein's [3] method of allowing the contents to siphon and determining the appearance time was beset with two main difficulties. First, siphonage on a relatively empty stomach is unsatisfactory when one attempts to observe gross changes in short periods of time. Second, quantitation of the excreted dye is impossible without a more satisfactory drainage. To counteract these factors, the following method was devised.

METHOD

On a fasting stomach, a Rehfuss tube is passed and lavage with water is continued until the return is clear. Four cubic centimeters of a 1 per cent. aqueous solution of neutral red is then injected intramuscularly into the buttocks. Fifty cubic centimeters of tepid tap water is instilled into the stomach and allowed to siphon into a flask. At the end of fifteen minutes the remaining water is extracted and put into the flask. Fifty cubic centimeters of tepid water is again added and allowed to drain into another flask. The addition of 50 c.c. of water and subsequent siphonage are repeated every fifteen minutes until two hours after the injection of the dye. The appearance time of the dye is noted in a glass window in the tube.

We have also computed the amount of excretion in the urine, hoping to be able to ascertain some relationship to the gastric output. Our results are such that we think it superfluous for the clinical conduct of the test. However, the determination was done by having the patient void before the injection of the dye (this specimen of urine being retained as a contrast substance to be used in a comparator) and again two hours after the injection of the dye.

Reading.—The amount of excretion of the dye is computed by comparing a given specimen with standards of varying intensity. Our standards are made up from 1:5,000 to 1:1,000,000, inclusive (containing, respectively, 20 mg. and 1 mg. to 100 c.c.), are put up in test tubes of 110 by 10 mm.; the standards from 1:100,000 to 1:1,000,000 are put up in test tubes of 215 by 25 mm. (containing, respectively, 1 mg. and 0.1 mg. to 100 c.c.). The more concentrated standards in the smaller tubes are compared with the unknowns in test tubes of like size; the less concentrated standards in the large tubes are compared with the unknowns in tubes of equal size. Reflected light has been found most satisfactory for comparison. It is almost impossible to read greater dilutions than 1:1,000,000, although definite dye content can be seen; such specimens are then said to have a *trace*. It is felt that standards should be made up at least once monthly and should be kept in the dark when not in use.

Difficulties in Reading.—The difficulties in reading occur because of conflicting substances on the one hand, and the alkalinity of the stomach contents of some persons on the other. Bile, blood and food contents have been sources of annoyance in attempting to get accurate readings.

By modifying Cowan's method, as outlined by Piersol and Bockus [7] for duodenal contents, satisfactory readings of bile-tinged specimens have been obtained. Our modification consists in taking 10 c.c. of the specimen in a 15 c.c. centrifuge tube, adding 0.3 c.c. of a concentrated solution of lead acetate and 0.2 c.c. of a

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* Read before the Section on Gastro-Enterology and Proctology at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

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concentrated solution of calcium chlorid, heating in a water bath for five minutes, centrifugalizing at high speed for ten minutes, and comparing the supernatant fluid with the standard to determine the concentration of the dye. Before this method for quantitating bile-stained specimens was used, only the presence of the dye was noted on filter paper. Some of our determinations are recorded as containing *bile and dye;* these determinations were done before the use of the modification of the Cowan method.

excrete the dye. On the alkaline side, neutral red is yellowish; by adding a few drops of glacial acetic acid to every yellow specimen and determining the reaction to litmus paper, one may differentiate bile from alkaline neutral red.

RESULTS

Determinations have been made on six groups of cases: (1) those without gastro-intestinal disease (symptoms or lesions) or anemia; (2) peptic ulcer; (3) gastric carcinoma; (4) secondary anemia with gas-

TABLE 1.—*Observations on Patients without Digestive Disease or Anemia*

Case	Diagnosis	Appearance Time, Minutes	Amounts Recovered from Stomach (Mg.) in Fifteen Minute Periods								Amount Recovered from Stomach, 2 Hours	Amount Recovered in Urine, 2 Hours	Total Amount Recovered, 2 Hours	Percentage of Recovery	
			0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120				Stomach	Urine
1	Pleural effusion	22	0	0.3	0.9	0	0	0	0	0	1.2	2.4	3.6	3.0	6.0
2	Bayonet wound of abdomen	25	0	0	Trace	0.1	0.2	0.09	Trace	0	0.31+	4.0	4.31+	0.7+	10.0
3	Arthritis	20	0	0.14	0.2	0.1	0.12	Trace	Trace	Trace	0.56+	.....	.....	1.4+	....
4	Neurasthenia	40	0	0	Trace	Trace	0.007	0.085	0.007	0	0.099+	4.95	5.049+	0.2+	12.3
5	Postpneumonic asthenia	25	0	0	0.065	0.085	0.13	0.06	0.07	0.005	0.42	1.05	1.47	1.05	2.6
6	Postpneumonic asthenia	25	0	Trace	Trace	Trace	0	0	0	0	Trace	3.8	3.8+	?	9.5
7	Pulmonary tuberculosis	30	0	0	0.13	0.074	0.43	0.183	0.06	0.227	1.103	6.8	7.904	2.7	17.0
8	Pleural effusion, bullet wound	9	0.182	0.305	0.29	0.133	0.104	0.06	0.052	Trace	1.127+	5.228	6.356+	2.8+	13.0
9	Convalescent pneumonia	18	0	0.084	0.102	Trace	0.067	Trace	Trace	0	0.252+	4.02	4.272+	0.6+	10.0
10	Arthritis	10	Trace	Trace	Trace	Trace	Trace	Trace	Trace	Trace	Trace	2.924	2.924+	?	7.3
11	Neurasthenia	20	0	Trace	Trace	0.031	0.061	0.047	0.132	0.051	0.322+	4.1	4.422+	0.8+	10.2
12	Lead poisoning	10	0.188	0.238	0.429	0.82	0.555	0.272	0.705	0.137	3.344	9.996	13.340	8.3	25.0
13	Bronchitis, emphysema	20	0	Trace	Trace	0.542	0.64	1.38	0.91	0.082	3.553+	21.75	25.303+	8.8+	54.3

TABLE 2.—*Observations on Patients with Peptic Ulcer*

Case	Location	Appearance Time, Minutes	Amounts Recovered from Stomach (Mg.) in Fifteen Minute Periods								Amount Recovered from Stomach, 2 Hours	Amount Recovered in Urine, 2 Hours	Total Amount Recovered, 2 Hours	Percentage of Recovery	
			0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120				Stomach	Urine
23	Duodenum	17	Trace	0.275	Bile and dye	0.126	0.088	0.08	0.1	Trace	0.669+	1.125	1.794+	1.6+	4.4
24	Duodenum	30	Bile	Bile	0.1	0.07	0.05	0.068	0.07	Trace	0.318+	5.7	6.048+	0.87+	14.2
25	Duodenum	15	0.016	0.208	0.35	0.205	0.124	0.126	0.122	0.077	1.228	3.507	4.756	3.1	8.8
26	Stomach	20	0	0.395	0.453	0.18	0.459	0.37	0.38	0.15	2.387	10.6	12.987	8.0	26.5
27	Stomach	15	0	Blood and dye	0.165	0.13	Blood and dye	Blood and dye	Blood	Blood	0.295+?	4.6	4.895+?	...	11.5

TABLE 3.—*Observations on Patients with Carcinoma of Stomach*

Case	Location	Appearance Time, Minutes	Amounts Recovered from Stomach (Mg.) in Fifteen Minute Periods								Amount Recovered from Stomach, 2 Hours	Amount Recovered in Urine, 2 Hours	Total Amount Recovered, 2 Hours	Percentage of Recovery	
			0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120				Stomach	Urine
14	Pylorus	30	0	0	Trace	Trace	0.039	Trace	0	0	0.039+	10.0	10.039+	0.1+	25.0
15	Pyloric antrum and fundus	65	0	0	0	0	Trace	0	Trace	Bile	Trace	3.75	3.75+	?	9.4
16	Fundus	30	Bile	Bile	Bile and dye	Bile and dye	Bile and dye	Bile and dye	Bile and dye	Bile and dye	Bile and dye	0.2	0.2+?	?	0.5
17	Repeat of No. 16 (2 mo. later)	60	Bile	Bile	Bile	Bile and dye	Bile and dye	Bile	Bile	Bile	Bile and dye	2.5	2.5+?	?	6.2
18	Fundus	45	0	0	0	0.022	0.009	0.025	0.067	0	0.123	2.36	2.483	0.3	5.9
19	Fundus	15	0	Trace	Trace	Trace	0.25	0.34	0.163	0.5	1.253+	.....	.....	3.1+	...
20	Pyloric antrum	45	0	0	0	0.054	0.088	0.112	0.073	Trace	0.328+	2.12	2.448+	0.8+	5.3
21	Pyloric antrum	15	0	0.041	0.033	0.022	0.05	0.06	0.068	0.066	0.336	.....	.....	0.8	...
22	Pylorus	15	0.134	0.069	0.15	0.034	0.033	0.03	0.024	0.042	0.511	2.24	2.751	1.2	5.6

We have been unable to devise a satisfactory quantitative test when blood is present. It is felt, however, that the dye can be qualitatively detected by acidifying with glacial acetic acid, thereby converting the hemoglobin to acid hematin. The solution is then filtered, and the presence of dye on the filter paper serves as a qualitative test.

To eliminate the difficulties presented by food contents, the solution is centrifugalized and the supernatant fluid compared with the standards. Opalescence is fairly well combated by viewing against a filter paper background.

Many patients who have alkaline stomach contents that is, alkaline to neutral red or of a p_H over 7) will

tric anacidity; (5) pernicious anemia, and (6) miscellaneous. Tables 1 to 6 show the findings in the cases studied.

The group of patients studied without symptoms or evidences of disease in the alimentary tract all excreted the dye at some time in the test period. The average appearance time was 22.8 minutes after the injection, with the individual observations ranging from 9 to 40 minutes.

The average period during which the dye was present in the gastric contents was 1.4 hours. As not all the cases were checked by gastric analyses, comparative figures are not available. There is no striking uniformity in the excretion in this group; many showed

only a trace at periods in the test; one showed only a trace in three specimens.

Five patients with peptic ulcer with hyperacidity were studied, all of whom excreted the dye. The average appearance time was 19.4 minutes after the injection, the individual observations ranging from 15 to 30 minutes. The average period during which the dye was present was 1.8 hours. There seems to be a tendency toward a greater excretion of the dye in the first hour of the test period.

with the individual observations ranging from 30 to 90 minutes. The average period during which dye was present was 0.75 hour. The general tendency appears to be toward a very low excretion, but one patient showed a higher excretion, late in the test period, than any other patient examined.

Eight patients with pernicious anemia were studied, none of whom excreted the dye within the two hour test period. It is interesting to note that though the stomach as an avenue of exit for the dye was not func-

TABLE 4.—*Observations on Patients with Secondary Anemia (with Gastric Anacidity)*

Case	Supplementary Diagnosis	Appearance Time, Minutes	Amounts Recovered from Stomach (Mg.) in Fifteen Minute Periods: 0–15	15–30	30–45	45–60	60–75	75–90	90–105	105–120	Amount Recovered from Stomach, 2 Hrs.	Amount Recovered in Urine, 2 Hrs.	Total Amount Recovered, 2 Hrs.	Percentage of Recovery: Stomach	Urine	Red Blood Cells	Hemoglobin	Color Index
28	Hemorrhoids.....	60	0	0	0	0	Trace	0.048	Trace	0	0.048+	14.25	14.298+	0.1+	35.6	5,600,000*	84	0.75
29	Arthritis.....	30	0	0	0.045	0.215	0.097	0	0	0	0.357	.....	.....	0.9	....	.....	..	....
30	Hemorrhoids.....	60	0	0	0	0	0.037	0.006	0.079	0	0.182	.....	.....	0.4	....	1,488,000	40	1.4
31	Sprue ?; Addison's disease ?	30	0	0	0.252	0.052	Bile and dye	7.2	6.2	1.22	14.924+	10.143	25.067+	37.3+	25.3	1,620,000	24	0.75
32	.....	75	0	0	0	0	0	Trace	0.055	Trace	0.055+	.....	.....	0.1+	....	4,190,000†	36	0.43
33	Arteriosclerosis.....	90	0	0	0	0	0	0	0.22	2.36	2.58	2.165	4.745	6.4	5.4	2,600,000	55	1+
34	General arteriosclerosis	60	0	0	0	0	0.031	0.094	0.045	0.075	0.245	1.073	1.319	0.6	2.6	2,100,000	20	0.47
35	.....	75	0	0	0	0	0	Trace	0	0	Trace	6.56	6.56+	...	16.4	4,560,000	43	0.47

* Patient had been under observation for twenty hours. Anacidity constant. Before transfusion: red blood cells, 3,512,000; hemoglobin, 30; color index, 0.4.

† Case was diagnosed as secondary anemia and anacidity in 1916.

TABLE 5.—*Observations on Patients with Pernicious Anemia*

Case	Appearance Time, Minutes	Amounts Recovered from Stomach (Mg.) in Fifteen Minute Periods: 0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120	Amount Recovered from Stomach, 2 Hrs.	Amount Recovered in Urine, 2 Hrs.	Total Amount Recovered 2 Hrs.	Percentage of Recovery: Stomach	Urine	Red Blood Cells	Hemoglobin	Color Index
36	0	0	0	0	0	0	0	0	0	0	0.68	0.68	0	1.7	3,370,000	77	1.1
37	0	0	0	0	0	0	0	0	0	0	2.4	2.4	0	6.0	1,250,000	27	1.1
38	0	0	0	0	0	0	0	0	0	0	0.26	0.26	0	0.6	1,875,000	44	1.2
39	0	0	0	0	0	0	0	0	0	0	7.6	7.6	0	19.0	3,300,000	87	1.3
40	0	0	0	0	0	0	0	0	0	0	...	...	0	...	1,650,000	44	1.3
41	0	0	0	0	0	0	0	0	0	0	4.4	4.4	0	11.0	1,200,000	28	1.2
42	0	0	0	0	0	0	0	0	0	0	8.725	8.725	0	21.8	1,500,000	42	1.4
43	0	0	0	0	0	0	0	0	0	0	....	....	0	...	600,000	12	1.0

TABLE 6.—*Observations on Patients with Miscellaneous Diseases*

Case	Diagnosis	Appearance Time, Minutes	Amounts Recovered from Stomach (Mg.) in Fifteen Minute Periods: 0–15	15–30	30–45	45–60	60–75	75–90	90–105	105–120	Amount Recovered from Stomach, 2 Hrs.	Amount Recovered in Urine, 2 Hrs.	Total Amount Recovered, 2 Hrs.	Percentage of Recovery: Stomach	Urine	Comment
44	Asthma.....	0	0	0	0	0	0	0	0	0	0	1.8	1.8	0	4.5	Color index, 1.2; no marked anemia; atrophic glossitis; anacidity; loss of weight
45	Cardiorenal.....	22	0	Trace	0.035	0.078	Trace	0.06	Trace	Trace	0.173+	1.25	1.423+	0.4+	3.1	
46	Paget's disease.....	30	0	0	3.24	0.38	1.5	0.638	1.26	2.52	9.538	5.267	14.805	23.8	13.1	Gastro-enterostomy for leiomyoma
47	Abdominal carcinoma and carcinoma of liver	7	0.156	0.1	0.268	0.43	0.4	0.09	0.092	0.136	1.672	9.0	10.7	4.2	22.5	
48	Sprue.....	30	0	0	0.012	0.004	0.026	0.033	Trace	0.024	0.129+	.....	.....	0.3+	....	Red blood cells, 1,000,000; hemoglobin, 24; color index, 1.2

Nine patients with carcinoma of the stomach were studied, all of whom excreted the dye. The average appearance time was 35.5 minutes after the injection, with the individual observations ranging from 15 to 65 minutes. The average period during which the dye was present was 1.25 hours. The excretion of the dye seems to be generally less than in either of the foregoing groups, though one patient (Case 19) showed high excretion late in the collection period.

Eight patients with secondary anemia with anacidity were studied, all of whom excreted the dye. The average appearance time was 60 minutes after the injection,

tioning, the urinary excretion was not consistently higher than in those patients with high gastric excretion. The adequate return-flow obtained and the likelihood that the emptying time is not appreciably shorter than in the group of secondary anemia with anacidity suggest that the rapid emptying time usually found in gastric anacidity is not responsible for the inability to recover dye in the cases of pernicious anemia.

A number of patients not falling into the foregoing groups were studied, of whom only one failed to excrete the dye. This patient (Case 44) was about 60 years of age and asthmatic (probably simple bronchial

asthma). At the time of the examination he certainly did not have a typical case of pernicious anemia, but he presented the following striking features: atrophic glossitis, achylia gastrica and high color index. It is questionable whether this case might be considered one of pernicious anemia in a remission, though there was no previous history of marked anemia. Another case (48), of tropical sprue, presented a blood picture absolutely typical of pernicious anemia, but the dye was excreted in fairly large amounts over a long period of time. Case 46 is interesting because of a previous gastro-enterostomy for a leiomyoma of the stomach; the patient had a high excretion of the dye without any evidence of bile in the contents obtained.

Some preliminary experiments have been done to ascertain the mechanism of the excretion of this dye. Rabbits and cats injected with 2 c.c. of the dye showed, when killed one-half hour afterward, abundant excretion of the dye lying on the rugae of the stomach, especially in the fundal region; in addition, the pelves of the kidneys had a definite reddish hue. These experiments suggested, as have those of previous workers, that the principal avenues of exit are by way of the stomach and the kidneys, though the intestines and liver also excrete it. Frozen sections made of the stomach in these animals demonstrated, as has been noted by Harvey and Bensley,[8] that the dye is seen in its alkaline color at the base of the glands of the fundal portion of the stomach and in its acid color at the lumina of the glands.

The dye has been shown to be reabsorbed from the alimentary tract. A normal human subject taking 40 mg. by mouth in a capsule excreted the dye for thirty hours. It was not, however, recovered quantitatively from the urine. Absorption from the intestine was noted by Schlaepfer[9] in 1908.

As the kidneys and stomach are the main avenues of exit and have usually acid secretions, the possibility of acid in the lumen of an organ attracting the dye was borne in mind. To determine this, patients with pernicious anemia, who under the conditions of the test did not excrete the dye, were used. Four cubic centimeters of a 1 per cent. solution was injected intramuscularly and 100 c.c. of fortieth normal hydrochloric acid was put into the stomach. Observations for two hours showed no excretion of the dye.

As many observers[10] concluded that the excretory power of the stomach for neutral red paralleled its secretory power, experiments were done on a dog with Pawlow pouch to ascertain the effects of food stimuli on the excretion of neutral red from the pouch. Two cubic centimeters of a 1 per cent. solution of neutral red was injected intramuscularly. Twenty-five cubic centimeters of water was used to lavage the pouch at the end of each fifteen minute period, during which time the drops were collected in a container in the usual way. Observations were obtained on the fasting animal and again, four days later, when stimulated with a meat meal, containing approximately 100 gm. of protein, at the time of the injection. Table 7 shows one such experiment.

COMMENT

The extreme variations of the gastric secretion in health and disease make one skeptical of the possibilities of the utilization of any method that does not give clear cut uniformly characteristic curves for the disease complex. Previous observers[11] have reported characteristic appearance times for various gastric conditions. The averages of our appearance times appear to have substantiated the relationship obtained in their results; that is, that the appearance time in hyperacidity (as in ulcers) was earlier than in a normal group (without digestive disease), and that in gastric anacidity it is late or absent. Our figures are not strictly comparable to those of previous workers because of the difference in method; siphonage without the instillation of fluid was used by previous observers. This, on the one hand, might delay the observance of the dye through factors of dilution, while, on the other hand, it might accelerate the realization of the color through a more rapid flow from the stomach. Furthermore, the fact that water is an adequate stimulus to gastric secretion may introduce another factor, which obviates comparison of these results with those of previous observers. The variations in the appearance times among individuals is so great that it seems impossible to draw any conclusions as to the pathologic physiology of the stomach with this method.

It was hoped that the introduction of a quantitative method would give data characteristic of disease complexes. The total dye excreted in the hyperacidity (ulcer) cases is higher than in our group without digestive disease (gastric analysis undetermined); patients with gastric anacidity who do excrete the dye have a generally lower excretion. But the differences among individuals are such that no characteristic quantitative excretion curve can be accepted for any type of case, as may be seen strikingly in Case 31 (anacidity, and a total excretion of 14.9 mg.) and in Case 24 (hyperacidity and a total excretion of 0.34 mg.). It is, however, interesting that the period in which dye was present in the stomach is for those without digestive disease 1.4 hours; for those with peptic ulcer with hyperacidity, 1.7 hours; with carcinoma of the stomach, 1.25 hours, and for those with secondary anemia with anacidity, 0.75 hour. Observations 16 and 17 on a case of carcinoma of the stomach done two months apart show a decreased period of presence of the dye as the neoplasm advanced.

The striking feature of these results is that within the anacidity group are two types of individuals, those who do and those who do not excrete the dye within the two hour test period. In the former group are the cases of carcinoma of the stomach and those of secondary anemia with anacidity; in the latter are the cases of pernicious anemia and one doubtful case. There have been several cases in which the differential diagnosis between secondary anemia with anacidity and pernicious anemia has been difficult; the differentiation by the excretion of neutral red has been very helpful in these instances.

TABLE 7.—*Observations on Dog with Pawlow Pouch*

	Amounts Recovered from the Pouch (Mg.) in Fifteen Minute Periods								Total Amount Recovered, 2 Hrs.
	0–15	15–30	30–45	45–60	60–75	75–90	90–105	105–120	
Fasting	0	0.018	0.023	0.06	0.12	0.022	Trace	0.02	0.243
After protein meal	0.03	0.088	0.076	0.063	0.026	0.017	0.024	Trace	0.324

8. Harvey, B. C. H., and Bensley, R. R.: Formation of Hydrochloric Acid in the Foveolae and on the Surface of the Gastric Mucous Membrane and the Nonacid Character of the Contents of the Gland Cells and Lumina, Biol. Bull. **23**: 225 (Sept.) 1912.

9. Schlaepfer: Eine neue Methode zur Funktionsprüfung des Magens, München Med. Wchnschr. **55**: 1865 (Sept. 8) 1908.

10. Glaessner and Wittgenstein (Footnote 3, first reference). Koopman (Footnote 5). Carnot and Gaehlinger (Footnote 6).

11. Glaessner and Wittgenstein (Footnote 3, first reference). Carnot and Gaehlinger (Footnote 6).

As experimentally neutral red is seen in abundance in the lumen of the hydrochloric acid secreting glands in its characteristic reddish acid hue and in the cells themselves in its yellowish alkaline hue, the possibility arises that its excretion into the stomach depends on the integrity of the hydrochloric acid secreting tissue of the stomach. It is known that abundant hydrochloric acid secreting tissue may exist in the stomach in the presence of a neoplasm; on the other hand, many pathologists feel that there is absence of hydrochloric acid secreting tissue in pernicious anemia. In view of this opinion, which is prevalent, though by no means established by fact, the complete absence of excretion of the dye in cases of pernicious anemia suggests its value in demonstrating the presence of hydrochloric acid secreting tissue. The delayed appearance without complete absence, in the other types of anacidity, may indicate a diminished excretion in stomachs on account of malfunctioning glandular tissue, or in which only a small amount of glandular tissue remains intact (of the hydrochloric acid secreting type). The relatively increased excretion in our cases of hyperacidity and in our Pawlow pouch dog after stimulation of gastric activity suggests that some relationship exists between the secretory ability of the stomach and the excretion of neutral red. But, for clinical purposes, the variations are so great among different individuals that only its presence or absence can be considered of diagnostic value.

The excretion of the dye in long standing secondary anemia with anacidity and its absence in pernicious anemia are especially interesting as regards the possible pathogenesis of the gastric picture in pernicious anemia. Our data are suggestive that long standing anemia in itself will not produce the type of excretion curve seen in pernicious anemia. This suggests that the gastric lesions in pernicious anemia are the result of some toxic factors, such as cause the blood and neurologic features.

CONCLUSIONS

1. Contrary to the observations of previous workers, the appearance time of neutral red in the stomach after the intramuscular injection is not sufficiently uniform in various gastric syndromes to be of clinical value.
2. Quantitative studies show too great variability of excretion to be of diagnostic value.
3. The presence or absence of excretion of the dye are the only points of clinical significance; i. e., in the differentiation of two types of gastric anacidity. The complete absence of the dye in pernicious anemia in contrast to its excretion, even in small amounts, in carcinoma with anacidity and secondary anemia with anacidity is of definite practical value.
4. The excretion of neutral red in the human stomach is probably dependent on the presence of hydrochloric acid secretory tissue.

ABSTRACT OF DISCUSSION

DR. GEORGE MORRIS PIERSOL, Philadelphia: I have been particularly interested in this paper because for some time we have been working with this test. We approached the subject from a slightly different angle. Instead of grouping our cases according to diagnosis, we were especially anxious to determine what, if any, relationship existed between the elimination of this dye and the degree of gastric acidity. Therefore, we divided our cases into those in which there were normal, hyperacid and hypo-acid stomachs. In the beginning we followed a technic identical with that adopted by Dr. Davidson, introducing 40 mg. of the dye intramuscularly, and then determining its appearance time. We further followed his technic in that we used the drip method of expressing the gastric contents. Our results, in the main, corresponded to those obtained by Davidson, Willocx and Haggansen when they determined the appearance time of the dye. We found in a group of hyperacid cases that the average appearance time was twenty-three minutes, somewhat longer than theirs, which I believe was nineteen minutes. In our normal cases the average appearance time was fourteen minutes, in contrast to twenty-two and four-fifths minutes in their series; whereas in our subacid cases the time was thirty-two minutes, as compared to their average of thirty-five and one-half minutes. We also observed the same extraordinary individual variation in the appearance time as they did. We next attempted the quantitative determination of the dye eliminated, again employing the technic of Davidson, Willocx and Haagensen, injecting 40 mg. of dye intramuscularly. Here, again, we observed wide individual variations and found extremely small quantities of dye eliminated by the stomach. We obtained figures considerably lower than the figures given by the authors in their charts.

By the intravenous method we found the average appearance time to be four minutes in hyperacid cases, six minutes in the normal subjects, and fourteen minutes in the subacid cases. The amount of dye eliminated averaged 1.69 mg. in normal acidity cases, 2.39 mg. in hyperacidity cases, and 0.35 mg. in subacidity cases. From these observations we feel that this intravenous technic is, on the whole, the more satisfactory. The intravenous use of the dye proved of most value in the diagnosis of achylia gastrica. In a series of alleged achylia gastrica cases in which no dye was eliminated after intramuscular injection, in about 50 per cent. some dye was eliminated after intravenous injections, but in true achylia even after intravenous injection no dye appeared in the stomach. It is our feeling that the greatest clinical value of the test is in the recognition of true achylia gastrica. In all other cases the individual variations are too great to make the method reliable. We discovered that the dye was never eliminated from the saliva. We always found it eliminated in the urine, the quantity in the urine varying with the amount secreted in the stomach.

We have been forced to the conclusions quite identical with those of Davidson, Willocx and Haggansen that the neutral red test for gastric function is not satisfactory because of its wide variations, and that consistent results are found only in achylia gastrica.

DR. A. J. CARLSON, Chicago: Since achylia gastrica seems to indicate that the excretion of the dye by the stomach depends on the integrity of the acid secreting mechanism, I wonder whether Dr. Piersol and Drs. Davidson, Willocx and Haggansen might not consider it expedient to combine the intravenous injection of the dye with histamin. Histamin is a definite stimulant to gastric secretion in man by mouth or hypodermically in doses too small to have any systemic effect. On the question of the dye and the acid producing cells, Dr. Ivy and Drs. Davidson, Willocx and Haggansen have worked on this problem for some time. They find an acid reaction in the lining and actively secreting cells contrary to the observations of Davidson, Willocx and Haggansen.

DR. MARTIN G. VORHAUS, New York: Last year, Dr. L. M. Gompertz and I reported on gastric analyses made in fifty cases after Ewald and after injection of histamin. Fifteen cases showed an achylia gastrica after the Ewald test. Ten of these after the histamin test show considerable quantities of combined free acids; in some instances, normal or above normal values were attained. We showed that histamin stimulates gastric secretion and offers a differential diagnostic means between pseudo-achylia gastrica and achylia gastrica vera.

DR. PERCY B. DAVIDSON, Boston: Regarding the use of the intravenous route, I have the feeling that when injecting a large amount of the dye into the blood stream at one time, the staining of the stomach, as well as of the other tissues, may give rise to the presentation of the dye in the stomach by virtue of diffusion rather than as an active excretion by the stomach tissue. I think that if it is given intramuscularly, the stomach has the opportunity of taking up the dye rela-

tively slowly and excreting it, without the probability of mere diffusion through staining playing any prominent part. Then, as regards Dr. Carlson's question about a definite relationship to urinary output, we have not been able to substantiate this. We feel that the cases under observation showed no definite relationship between gastric excretion and urinary output. Replying to Dr. Carlson's suggestion about the use of a constant stimulus, such as histamin, our technic consisted of the instillation every fifteen minutes of water, which Pawlow has found to be an adequate stimulus to gastric secretion. About the statements of finding the tissue entirely acid in reaction, I would say, from our experience, that, if one examines the tissue after a half-hour following the death of the animal, it will show a uniform acid reaction; but if seen within fifteen minutes, it will give a definite distinction of the acid and alkaline reactions.

THE DIURETIC ACTION OF AMMONIUM CHLORID AND NOVASUROL

IN CASES OF NEPHRITIS WITH EDEMA *

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We have previously reported the successful use of ammonium chlorid in a case of nephritis with edema. We were led to the substitution of ammonium chlorid for calcium chlorid chiefly because of the difficulty in administering the latter. In many cases calcium chlorid caused nausea and vomiting, while these symptoms were much less frequent and troublesome after the ingestion of ammonium chlorid. Gamble, Blackfan and Hamilton,[1] for similar clinical reasons, have administered ammonium sulphate and ammonium chlorid to children with nephritis.

Since our first successful use of ammonium chlorid, this salt has received a thorough trial in different types of nephritis with edema. In many it produced prompt diuresis, with rapid disappearance of the edema. In others, its beneficial effects were temporary and slight. In the latter cases, the organic mercury compound novasurol was administered, and as a rule the resulting diuresis was most striking. These results with novasurol were in harmony with the therapeutic effects previously reported by Mühling[2] and Ulrich.[3] The present series of patients, many of whom had had persistent edema for weeks and months, reveals the importance of the application of these newer diuretics to the treatment of nephritic edema.

CLINICAL FINDINGS ON ADMISSION

Twelve cases of nephritis with edema were studied. The ages of the patients varied from 9 to 69 years. The amount of visible edema varied from a moderate diffuse edema to marked general anasarca. Edema had been present for periods of from ten days to two years. Half the cases fall into the nephrosis type of renal disease; five were of glomerulonephritis, acute and chronic, and one suggested an amyloid kidney. The routine urinalysis showed varying degrees of albuminuria and cylindruria. Arterial hypertension was always present in the glomerular type of the disease, while a moderate retinitis was found in only two cases of glomerulonephritis. In no case was serious cardiac impairment observed. Studies of hepatic function in five cases revealed no definite hepatic insufficiency (Table 1). In regard to renal function the most striking abnormality was the delayed excretion of chlorids and water. The initial phenolsulphonephthalein output varied from 35 to 75 per cent. with the exception of Case 12, in which it was reduced to 5 per cent. In the latter case there was further evidence of marked renal insufficiency, the blood creatinin reaching 9 mg. for each 100 c.c. Retention of nitrogenous substances in the blood, and anemia, were exceptional rather than regular manifestations in these cases. Two patients gave a history of syphilitic infection, and in one of these the Wassermann reaction was positive (Tables 1 and 2).

The patients sought medical advice chiefly because of the presence of edema. Most of them had had it for a considerable time, and it had been resistant to previous methods of treatment.

ILLUSTRATIVE CASE ON ADMISSION

History.—A single woman, aged 44, was admitted to the hospital, April 30, 1924, complaining of generalized edema. Except for an attack of acute tonsillitis at the age of 14, and influenza in February, 1923, she had been in good health. A tonsillectomy was performed in November, 1923. The present illness began seventeen months before admission, with headaches and swelling of the ankles. Following an attack of influenza three months later, the edema gradually increased until it involved the upper legs and abdomen. Eight months after the onset, her face became edematous; she had been in bed almost continuously for one year because of the edema and headaches. Albumin was first found in the urine one year before admission. She had also known of her arterial hypertension for fifteen months. Various diets and other forms of treatment had been tried without benefit.

Examination.—There was definite generalized edema of the whole surface of the skin, most marked in the eyelids, arms, lower trunk and legs. Her weight was 163 pounds (74 kg.). The mucous membranes were distinctly pale. The thyroid was moderately enlarged and contained adenomatous tumors. The heart dulness measured 17 cm.; there was a systolic murmur over the base and apex, and possibly a small amount of fluid in pleural and peritoneal cavities. The systolic blood pressure was 230; the diastolic, 125. The ocular fundi showed moderate retinal arteriosclerosis and neuroretinitis. The urine contained albumin from 1 to 3, at times numerous casts, and occasionally a few pus cells, but no erythrocytes. The blood showed evidence of secondary anemia, the hemoglobin (Dare) being 60 per cent., while the erythrocytes numbered 3,800,000, and leukocytes 7,200. The basal metabolic rate was —13. The blood contained 34 mg. of urea and 1.2 mg. of creatinin for each 100 c.c., and the phenolsulphonephthalein excretion was 40 per cent. in two hours. A diagnosis of chronic glomerulonephritis with nephrosis was made (Case 3, Table 1).

THERAPEUTIC MEASURES

Diet.—It has long been recognized that the diet is a very important factor in the treatment of nephritic edema. Three types of diet have been used in these studies, with some striking results. Each contains 40 gm. of protein and a caloric value of 1,500. Diet 1

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* Because of lack of space, this article is abbreviated in THE JOURNAL by the omission of three tables. The complete article appears in the authors' reprints.

1. Gamble, J. L.; Blackfan, K. D., and Hamilton, Bengt: A Study of the Diuretic Action of Acids Producing Salts, J. Clin. Investigation **1**: 359 (April 20) 1925.

2. Mühling, Adolf: Studie über die diuretische Wirkungsweise von Quecksilber; Ausgeführt mit dem organischen Quecksilberpräparat Novasurol, München. med. Wchnschr. **68**: 1447-1449 (Nov. 11) 1921.

3. Ulrich: Zur Eklampsiebehandlung mit Novasurol, Deutsch. med. Wchnschr. **49**: 885-886 (July 6) 1923. Calomel and other compounds of mercury have been in use in treating renal dropsy since the beginning of the ninteenth century. Richard Bright, in his celebrated monograph on renal disease published in Guy's Hospital Reports in 1836, mentioned their use, but concluded that they often did more harm than good. This treatment has been revived several times since, with occasionally excellent results, but the diuresis is unfortunately usually accompanied by diarrhea.

is a routine diet for nephritic patients and contains 1,400 c.c. of water and 5 gm. of extra salt (sodium chlorid). Diet 2 is a salt-free nephritic diet and contains 1,400 c.c. of water and no extra salt (sodium chlorid). In Diet 3 the weighed low-salt diet contains and chlorin, 0.35 gm. All patients were allowed water up to 800 c.c. besides that in the food, to be taken when desired. In certain cases in which all three diets were tried, the patient showed a gradual loss of weight when kept on the weighed, low-salt diet, and a

TABLE 1.—*Clinical Data*

Case	Sex,* Age	Diagnosis	History	Date	Edema	Weight, Kg.	Blood Pressure		Retinal Changes	Blood Wassermann	Hepatic Function	Urine					Phenolsulphonephthalein, per Cent.	Diet	Medication
							Systolic	Diastolic				Specific Gravity	Albumin	Casts	Erythrocytes	Leukocytes			
1	♂ 23	Chronic glomerulonephritis	Edema first noted eighteen months before; convulsions fifteen months before	11/30/23	4	92.5	205	125	Slight residual	0	.....	1.025	2 to 4	1 to 3	0	1	25	No. 2 No. 3	Calcium chlorid
				2/11/24	0	55.4	125	85											
				6/ 3/24	0	70.0	140	80	Slight residual	...	.....	1.013	2	1 to 3	1 to 3	1	45	No. 2	
				6/11/24	.....	69.5	140	80											
				10/23/24	1 to 2	76.0	175	110	.....	...	.....	1.013	2	2	1	1	35	No. 3	
				11/ 4/24	0	67.0	150	90											
2	♀ 22	Chronic nephrosis	Slight edema and albuminuria seven years; moderate edema six months	2/21/24	2	77.6	140	110	0	0	.....	1.027	3 to 4	1 to 3	0	†	75	No. 3	Calcium chlorid
				3/25/24	Trace	70.4	110	70											
				9/27/24	2	75.5	104	80	0	0	.....	1.017	1 to 3	†	0	†	75	No. 3	Ammonium chlorid
				10/15/24	Trace	63.6	110	74											
				3/ 7/25	2 to 3	80.2	116	60	0	0	.....	1.025	1 to 3	0 to 3	0	1	85	No. 3	Ammonium chlorid
				4/20/25	0	64.6	110	75	.....	...	.....	.....	....	....	....	....	..	.....	Novasurol
3	♀ 44	Chronic glomerulonephritis	Edema seventeen months, weakness one month	4/30/24	3	74.0	230	124	Moderate	0	Normal	1.015	2 to 3	2 to 3	0	†	40	No. 2	Ammonium chlorid
				6/ 7/24	Trace	57.7	190	110	.....	...	.....								Calcium chlorid
				4/17/25	.....	62.5	200	100	Mild vascular changes	...	.....	1.015	1 to 3	1 to 2	0	†	40	No. 2	
				5/ 4/25	Trace	57.0	160	100											
4	♂ 17	Subacute glomerulonephritis	Edema one month	1/22/25	3	72.7	150	100	0	0	.....	1.016	1 to 2	1 to 2	2	1 to 2	35	No. 2 No. 3	Ammonium chlorid
				2/22/25	0	61.0	130	90											
5	♂ 69	Chronic nephrosis	Edema, oliguria and dyspnea one month	9/23/24	3	75.0	130	85	0	0	Normal	1.026	Trace	† to 1	0	0	45	No. 3	Ammonium chlorid
				10/22/24	0	50.4	120	75											
6	♂ 9	Chronic nephrosis	Edema and ascites four to five months	11/19/24	1	34.0	90	70	0	0	Normal	1.017	1	1	0	†	40	No. 3	Ammonium chlorid
				12/15/24	0	28.0	90	60											
7	♀ 26	Acute glomerulonephritis of pregnancy	Edema two weeks	7/24/24	1 to 2	78.6	160	90	0	—	Normal	1.026	2 to 4	1 to 2	0	1 to 2	55	No. 2	Ammonium chlorid
				8/ 5/24	0	68.0	130	90											
8	♀ 28	Acute glomerulonephritis of pregnancy	Edema and dyspnea one month	7/30/24	2 to 3	80.0	190	145	Moderate	—	.....	1.018	1 to 3	1 to 3	1	1	40	No. 2	Ammonium chlorid
				8/28/24	0	56.3	120	80											
9	♂ 35	Subacute nephrosis; syphilis of central nervous system	Edema one month	6/19/24	3	68.0	100	55	0	+	.....	1.029	Trace to 1	†	0	1	40	No. 2 No. 3	Ammonium chlorid, calcium chlorid
				7/30/24	0	64.0 54.5*	95	60	.....	...	.....	.....	....	....	....	....	..	.....	Needle drainage acupuncture
10	♂ 25	Chronic nephrosis	Edema occasionally six years; marked edema and weakness six months	1/14/25	2 to 3	75.0	135	90	0	0	.....	1.030	1 to 4	1 to 2	0	†	40	No. 1 No. 2 No. 3	Calcium chlorid, ammonium chlorid
				2/12/25	0	57.7	130	80	.....	...	.....	.....	....	....	....	....	..	.....	Novasurol
11	♀ 52	Chronic nephrosis; pulmonary tuberculosis nonactive	Edema and ascites; weakness two years	1/19/25	1 to 2	57.3	120	60	0	0	Normal	1.014	0 to trace	1 to 3	0	†	..	No. 1 No. 3	Ammonium chlorid novasurol
				2/14/25	0	48.0	120	75											
12	♀ 48	Amyloid kidney ?; syphilis 3; syphilitic cirrhosis	Albuminuria and renal insufficiency four years; ascites and edema ten days	11/12/24	2	51.0	120	60	0	0	.....	1.008	Trace to 1	0	0	1	5	No. 2	Ammonium chlorid
				12/ 6/24	1	43.6	110	50											

* In this column, ♂ indicates male; ♀, female. † Occasional.

800 c.c. water, and ions as follows: sodium, 0.49 gm.; potassium, 1.76 gm.; calcium, 0.23 gm.; magnesium, 0.20 gm., and chlorin, 0.74 gm. The weighed low-salt diet used in Cases 1 and 2 during the first two periods of study differed from Diet 3 only in low-salt content. This was as follows: sodium, 0.37 gm.; potassium, 2.58 gm.; calcium, 0.30 gm.; magnesium, 0.21 gm., tendency to gain in weight when placed on either of the other two.

The weighed low-salt diet was devised for the purpose of controlling as many factors as possible and still preserving a diet palatable to the patient. The protein and caloric value is the same as that of the nephritic diets. In the latter, only the protein, caloric

and water values are controlled, and those are subject to an error of ± 10 per cent., because the portions cannot be accurately served without weighing. The former does not admit of such a large error. The ionic content of the diet is low, the water content is low, the portions of food are weighed, and the fluid is measured, so that in every essential it is the same from day to day.

One patient (Case 1) was kept on the weighed low-salt diet, with no other medication for twelve days, during which time in the hospital his weight decreased from 167⅛ to 149⅜ pounds (76 to 68 kg.). Table 4 shows the remarkable constancy of the mineral content and total nitrogen of the urine.

It will be noted in Case 2 (Table 5) that during the control period of six days, before the giving of any medicine, after the patient had become adjusted to the diet, there is the same constancy in mineral content of the urine as noted in Case 1. The total nitrogen is about equivalent to that of the diet, and the ratio of urea nitrogen to ammonia nitrogen is quite normal. This case also indicated that a patient can take such a diet comfortably and without any demonstrably harmful effects for a period of forty-four days.

TABLE 2.—*Changes in the Blood*

Case	Date	Hemoglobin, Gm., per Cent.	Blood: Urea, Mg., per Cent.	Blood: Creatinin, Mg., per Cent.	Blood: Uric Acid, Mg., per Cent.	Carbon Dioxid Combining Power, per Cent. by Volume	Chlorin, Mg., per Cent.	Medication
1	11/30/23	12.9	56	2.0	3.8	..	...	Calcium chlorid
	12/10/23	13.4	34	1.5	3.8	..	...	12/10 to 12/18, 102 gm.
	12/12/23	....	..	...	...	..	...	12/23 to 1/1, 108 gm.
	12/13/23	....	25	...	...	42	360	1/10 to 1/18, 80 gm.
	12/14/23	....	..	...	...	47	...	
	12/20/23	....	29	...	...	..	...	
	12/26/23	....	..	...	...	36	...	
	12/31/23	....	..	...	...	50	396	
	1/15/24	11.6	16	...	...	46	...	
	1/16/24	....	..	...	...	45	386	
	1/26/24	12.7	22	1.9	3.2	..	...	
	2/ 1/24	....	28	...	...	50	...	
	6/ 4/24	11.3	43	1.8	4.7	..	397	
	10/24/24	13.8	40	2.2	3.4	54	394	
	10/31/24	14.4	36	2.8	4.4	55	386	
2	2/22/24	14.8	12	1.2	1.7	..	...	Calcium chlorid
	2/26/24	....	..	...	...	52	377	2/25 to 2/29, 40 gm.
	2/29/24	....	..	...	...	55	372	3/ 7 to 3/11, 30 gm.
	3/17/24	15.3	17	1.2	1.9	..	...	
	10/ 1/24	15.4	14	1.5	2.1	..	...	
	10/ 3/24	....	..	...	...	63	368	
	10/ 8/24	15.8	20	1.4	2.5	43	399	Ammonium chlorid
	10/15/24	....	..	...	...	38	...	10/4 to 10/8/24, 40 gm.
	3/ 9/25	....	19	1.5	...	55	402	
	3/12/25	....	11	...	...	56	378	
	3/18/25	....	16	...	...	44	390	Ammonium chlorid
	3/21/25	....	..	...	...	36	378	3/13 to 3/30/25, 162 gm.
	3/23/25	....	17	...	...	43	378	
	3/26/25	....	15	...	...	52	384	
	4/ 2/25	15.6	15	1.1	...	..	...	
	4/ 6/25	....	27	...	...	56	360	Ammonium chlorid, 137 gm.
	4/13/25	....	23	...	...	41	378	
	4/17/25	....	25	...	...	46	390	4/5 to 4/18/25
	4/18/25	....	..	...	...	51	378	
3	5/ 1/24	....	34	1.2	2.4	..	311	Ammonium chlorid
	5/12/24	....	35	1.4	2.4	38	...	5/8 to 5/17, 100 gm.
	5/17/24	....	..	...	...	25	...	
	5/20/24	....	40	...	...	..	400	
	6/ 2/24	....	10	1.2	2.6	50	379	Calcium chlorid
	6/27/24	....	22	...	...	48	...	6/24 to 6/27, 25 gm.
	4/21/25	9.5	24	1.7	2.4	44	420	
4	1/22/25	11.9	36	2.5	2.9	..	...	
	1/24/25	....	..	...	...	..	340	
	1/27/25	....	..	...	...	60	373	Ammonium chlorid
	1/29/25	....	41	...	...	60	...	1/29 to 2/7, 50 gm.
	2/ 2/25	....	46	...	...	40	438	
	2/ 6/25	....	..	...	...	24	...	
	2/ 7/25	....	48	...	...	26	429	Ammonium chlorid
	2/14/25	....	49	2.3	...	30	408	2/11 to 2/19, 64 gm.
	2/16/25	....	34	...	...	29	468	
	2/17/25	....	..	...	...	26	432	
	2/19/25	....	32	...	...	26	420	
	2/28/25	....	47	...	...	48	432	
5	9/24/24	14.9	37	1.3	2.9	..	...	Ammonium chlorid
	9/30/24	....	..	...	...	37	...	9/25 to 10/8, 130 gm.
	10/ 3/24	....	..	...	...	40	392	
	10/ 6/24	....	19	1.3	3.3	..	392	
	10/ 8/24	....	..	...	...	40	400	
	10/10/24	....	18	...	...	..	...	
	10/11/24	....	..	...	...	62	384	
	10/17/24	14.3	..	...	...	..	...	

TABLE 2.—*Changes in the Blood—Continued*

Case	Date	Hemoglobin, Gm., per Cent.	Blood: Urea, Mg., per Cent.	Blood: Creatinin, Mg., per Cent.	Blood: Uric Acid, Mg., per Cent.	Carbon Dioxid Combining Power, per Cent. by Volume	Chlorin, Mg., per Cent.	Medication
6	11/10/24	15.9	17	1.8	5.5	..	...	Ammonium chlorid
	11/25/24	....	..	1.1	3.2	..	...	11/20 to 11/30, 132 gm.
	11/26/24	....	..	...	...	22	426	
	11/28/24	....	..	...	...	29	...	
	12/ 1/24	....	..	...	...	46	377	
	12/ 9/24	....	..	...	...	50	...	
7	7/24/24	11.6	32	1.6	3.3	42	...	Ammonium chlorid
	8/ 5/24	....	30	1.5	4.7	28	...	8/1 to 8/5, 60 gm.
8	7/30/24	....	71	...	...	..	...	Calcium chlorid
	7/31/24	....	61	1.8	6.2	49	...	3/1 to 3/2, 20 gm.
	8/ 9/24	13.2	16	1.8	5.3	..	...	Ammonium chlorid
	8/11/24	....	..	...	...	41	...	8/5 to 8/15, 110 gm.
	8/15/24	....	17	...	...	40	...	
9	6/16/24	....	..	...	...	..	...	Ammonium chlorid
	6/19/24	....	60	...	...	..	...	6/23 to 6/30, 80 gm.
	6/23/24	....	23	...	...	60	...	Calcium chlorid
	6/24/24	16.8	39	1.9	2.2	..	...	7/2 to 7/3, 20 gm.
	6/26/24	....	..	1.4	...	..	...	
	6/27/24	....	35	...	...	29	...	
	6/30/24	....	..	...	...	38	...	Ammonium chlorid
	7/ 9/24	....	..	...	...	43	...	7/8 to 7/12, 40 gm.
	7/19/24	....	..	...	...	40	...	Calcium chlorid
	7/21/24	....	..	...	...	39	...	7/12 to 7/22, 100 gm.
	7/26/24	....	..	...	...	..	418	Ammonium chlorid
	7/31/24	17.3	40	...	...	50	444	7/22 to 7/30, 100 gm.
	8/ 5/24	....	..	...	...	..	372	
10	1/16/25	....	28	1.1	...	..	...	
	1/20/25	....	36	...	...	..	377	Calcium chlorid
	1/23/25	17.0	..	...	...	..	...	1/21 to 1/25, 76 gm.
	1/27/25	....	26	...	...	39	382	Ammonium chlorid
	1/30/25	....	35	...	...	43	400	1/28 to 2/6, 86 gm.
	2/ 3/25	14.9	27	...	...	37	412	
	2/ 5/25	....	..	...	...	26	...	
	2/ 9/25	....	..	...	...	60	446	
11	1/19/25	....	13	...	...	50	383	Ammonium chlorid
	1/21/25	....	22	1.3	2.5	..	...	1/19 to 1/27, 90 gm.
	1/26/25	....	35	...	...	28	424	
	1/29/25	....	..	...	...	60	373	
	1/31/25	....	29	...	...	38	419	Ammonium chlorid
	2/ 5/25	....	21	...	...	37	401	2/2 to 2/5, 21 gm.
12	11/13/24	....	114	9.0	6.0	..	...	
	11/18/24	....	109	9.8	...	..	...	Ammonium chlorid
	11/20/24	....	..	...	...	30	...	11/19 to 11/23, 25 gm.
	11/24/24							(5 gm. daily)
	a. m.	....	276	...	...	9	...	Kussmaul respiration
	p. m.	....	178	10.3	2.5	..	...	5 per cent. sodium bicarbonate intravenously
	11/25/24	....	166	9.6	4.5	51	...	
	11/28/24	9.1	170	10.3	4.0	..	...	
	12/ 3/24	8.9	178	9.8	5.0	..	...	
	12/ 5/24	....	...	...	...	34	...	

Ammonium Chlorid.—Ammonium chlorid was given by mouth to eleven patients in this series. The doses ranged from 5 to 16 gm. each day for periods of from three to eighteen days. The largest amount ingested was 162 gm. in a period of eighteen days. Ammonium chlorid usually causes a lowering of the alkali reserve of the blood plasma and an increased acidity of the urine. In cases in which the alkali reserve of the blood was decidedly decreased, ammonium chlorid was discontinued until the plasma bicarbonate became normal. In only a single instance, Case 12, was a condition of clinical acidosis induced. The result in this case indicates that ammonium chlorid should be given with great caution in the presence of severe renal insufficiency.

Novasurol.—Novasurol was injected intramuscularly and intravenously in doses of from 0.5 to 2.5 c.c. As a rule, it produced diuresis. It seemed to be more effective as a diuretic after the patient had taken suffi-

cient ammonium chlorid to render the urine decidedly acid. No untoward symptoms were encountered following its use in this series of cases, but a preliminary intramuscular injection of 0.5 c.c. is always given to observe the effect.

CLINICAL RESULTS

In ten of the twelve cases, striking diuretic effects were obtained. In one there was no marked change in the condition, while the other was included because a serious reaction followed the ingestion of ammonium chlorid.

TABLE 3.—*Changes in Serum and Plasma*

Case	Date	Mg. for Each 100 C.c. Chlorin	Sodium	Potassium	Calcium	Magnesium	Carbon Dioxid Combining Power, per Cent. by Volume	Medication
1	10/24/24	371*	326	23.0	8.2	2.2	54*	
	10/31/24	384	310	24.0	8.6	2.1	55	
2	2/25/24	377	354	....	9.5	...	52	
	2/29/24	372	291	....	8.5	...	55	Calcium chlorid
	10/ 1/24	306	358	19.5	...	...	63	
	10/ 8/24	397	339	20.9	...	...	46	Ammonium chlorid
	3/ 9/25	402	365	....	...	...	55	
	4/ 6/25	360	325	....	...	...	56	Ammonium chlorid
	4/17/25	390	315	....	...	...	46	Novasurol
	4/18/25	378	335	....	...	...	51	

* All determinations except chlorin and carbon dioxid made in serum.

Diet.—Spontaneous diuresis followed the administration of the weighed low-salt diet in Case 1 (Table 4, Chart 1). In twelve days the patient lost 13 pounds (6 kg.), and the edema disappeared. One patient (Case 4) during treatment with ammonium chlorid, and a second (Case 11), given both ammonium chlorid and novasurol, showed a gain in weight when the weighed low-salt diet was discontinued. With resumption of the weighed diet, weight was lost, and other beneficial results followed (Charts 2 and 3).

Ammonium Chlorid.—Diuresis, loss of weight, and disappearance of edema followed the use of ammonium chlorid on eight occasions in seven cases (Cases 2 to 8, Tables 1 and 2). Rapid marked diuresis occurred in three cases, while in five the increased elimination was indicated by persistent moderate polyuria. The first results obtained in Case 3 were typical. On admission, April 30, 1924, the patient weighed 162⅘ pounds (74 kg.). She was given a salt-free nephritic diet and a daily fluid intake of from 400 to 1,000 c.c. in excess of fluid in food. In eight days the patient lost 11 pounds (5 kg.), and in a single day the urine amounted to 2,350 c.c. As the diuresis began to lessen, May 7, she was given 8 gm. of ammonium chlorid. This daily dose was continued for the next ten days. The resulting diuresis was striking, and for several days the urine amounted to from 1,800 to 2,200 c.c. The loss of weight during the period of ten days until May 17 was 18 pounds (8.3 kg.). Ammonium chlorid was discontinued, chiefly because the patient had become practically free from edema, and the combined carbon dioxid of the plasma had decreased to 25 per cent. by volume. The patient continued to feel stronger and was dismissed from the hospital, June 2. She was instructed to follow a strict low-salt, low-fluid diet. In spite of her conscientious attempt to adhere strictly to this diet, she slowly began to increase in weight, and slight edema again appeared. She reentered the hospital, June 23, and for three days was held to the former diet. She was also deliberately given 10 gm. of calcium chlorid daily, in order to determine whether ammonium chlorid and calcium chlorid were equally efficacious as diuretics. Diuresis was prompt, and she lost 5½ pounds (2.5 kg.) in three days. The systolic blood pressure was now 190, and the diastolic 110, and she weighed 127 pounds (57.7 kg.). She had actually lost 36 pounds (16.3 kg.) since admission.

The patient returned home, and for ten months was able to carry on her vocation, that of a musician. She kept to a low-salt, low-fluid diet, and whenever edema became noticeable she would take ammonium chlorid, 5 gm. daily, for a week, and the edema would subside.

April 17, 1925, the patient returned for advice regarding a troublesome laryngitis. Physical examination showed only the slightest trace of edema. The weight was 138 pounds (62.5 kg.), the systolic blood pressure 200, and the diastolic 100. On the administration of the salt-free, low fluid nephritic diet for a few days, without other medication, she promptly lost 11 pounds (5.5 kg.), thus reaching a weight of 127 pounds (57 kg.), practically that at the time of her dismissal ten months before (Tables 1 and 2).

The loss of weight associated with diuresis due to ammonium chlorid in this series varied from 9 pounds (4 kg.) in nine days to 50 pounds (22.5 kg.) in fourteen days. The subjective relief experienced by the patient with the disappearance of the edema was often striking. In Case 7, the edema was associated with other manifestations of acute glomerulonephritis of pregnancy, the patient being in the eighth month. She had lost considerable of the edema on dietary restriction of salts and water, but a certain amount still persisted. On four days' treatment with ammonium chlorid, the edema disappeared with a loss of 10 pounds (4.5 kg.). The initial increased blood pressure had also fallen with the diuresis to a normal level. The patient then left the hospital, to return a week later. At that time, she was still free from edema and went through a normal delivery.

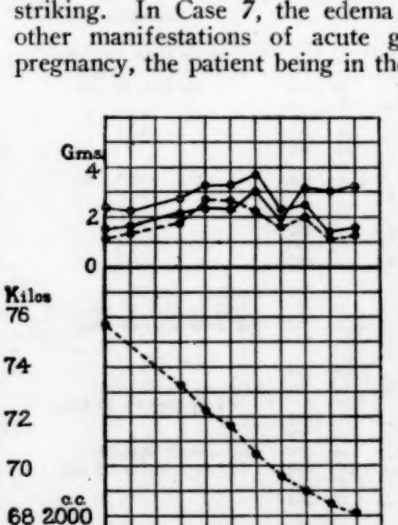

Chart 1 (Case 1).—Spontaneous diuresis: urinary findings.

The results with ammonium chlorid in Case 4 simulate those obtained in Case 1, with calcium chlorid, mentioned in our previous paper. On the first administration there was a moderate response, loss of 9 pounds (4 kg.) in weight in eight days, with still much residual edema. Following the second administration, beginning six days later, the diuresis was definitely more marked, 12 pounds (5.5 kg.) being lost in eight days. Diuresis and loss of weight went on after the ammonium chlorid had

been discontinued, until the edema entirely disappeared (Table 6, Chart 2).

The results in Case 9 were disappointing. After a thorough trial of both ammonium chlorid and calcium chlorid under excellent dietary control, marked edema was still present, and only 9 pounds (4 kg.) was lost. Subsequent tapping of the dependent edema in the legs by acupuncture resulted in a loss of 17 pounds (8 kg.) in ten days.

Serious symptoms followed the use of ammonium chlorid in Case 12 (Tables 1 and 2). Symptoms of renal insufficiency had appeared four years before while the patient was undergoing antisyphilitic treatment. On the present admission to the hospital there was evidence of serious renal insufficiency, there being 114 mg. of urea and 9 mg. of creatinin for each 100 c.c. of blood, besides ascites and dependent edema. Half of the usual dose of ammonium chlorid, 5 gm., was given daily for five consecutive days. On the sixth day the patient complained of feeling very weak and being short of breath. She had typical Kussmaul respiration. Immediate determination of the combined carbon dioxid of the plasma revealed that it was reduced to 9 per cent. by volume. The blood urea had also risen from 109 to 276 mg. The patient was treated energetically with alkali, including 1,000 c.c. of 5 per cent. solution of sodium bicarbonate intravenously. She promptly responded to treatment, and on the following morning had no respiratory symptoms, while the plasma showed a normal carbon dioxid capacity. This incident clearly indicates the danger of precipitating a clinical acidosis with ammonium chlorid when marked renal insufficiency already exists.

Ammonium Chlorid and Novasurol.—In Case 2, ammonium chlorid caused diuresis on two separate occasions. Previously, calcium chlorid had brought about a similar effect. In spite of the diuresis obtained on the second administration of ammonium chlorid (the third occasion, indeed, on which one of these diuretic salts had been given), a measurable amount of edema was still present. Novasurol in doses of 0.5 and 1 c.c. failed to increase the urinary volume. Both novasurol and ammonium chlorid were then administered with distinct diuretic effect. With repeated administration of both drugs, the edema subsided and the patient regained her normal weight.

The therapeutic results obtained in Case 10, Table 1, are of great interest (Chart 3). This young man had had marked general anasarca for six months. The edema was generalized, and included a firm brawny induration of the legs. After a trial of calcium chlorid in large doses, as much as 20 gm. daily, there was no visible change in the edema, and the weight remained stationary. With the institution of the combined measures, a weighed low-salt, low-fluid diet, ammonium chlorid and novasurol, the patient lost 37 pounds (16.8 kg.) in fifteen days, and all the edema disappeared. A similar result was obtained in Case 11 (Chart 4). In this instance a preliminary trial of low-fluid, low-salt diet and ammonium chlorid failed to produce a diuresis. Subsequently, when novasurol was added to the treatment the patient lost 16 pounds (7.3 kg.) in eight days.

From these results we can justly state that the immediate therapeutic effects of the diet, ammonium chlorid and novasurol are as a rule very satisfactory. The time since these patients were dismissed is yet so short that it cannot be determined accurately whether certain of them will remain permanently free from edema. Five of the patients have remained free from edema for periods of from two and one-half to seven months. Three patients with previous chronic edema have been able to keep the edema near the vanishing point for several months. In the latter group, we have yet to determine the exact diet, and the frequency and amount of medication necessary to keep the edema under control for prolonged periods.

CHANGES IN THE BLOOD AND URINE

The Blood.[4]—In every case in which ammonium chlorid was given, two characteristic chemical changes occurred in the plasma: a fall in the carbon dioxid combining power, and a rise in the chlorin content. Thus we confirmed the original observation of Haldane [5] that ammonium chlorid, when taken in adequate amount, diminishes the normal alkali reserve

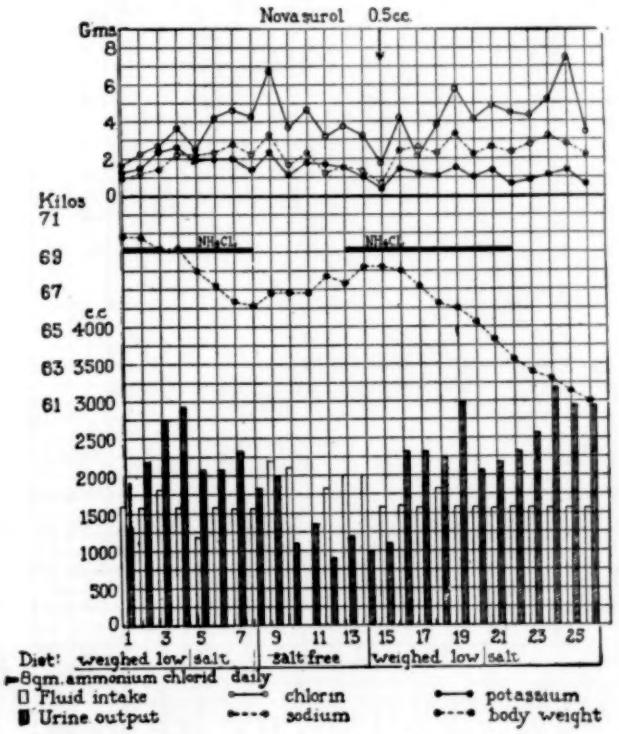

Chart 2 (Case 4).—Diuresis with ammonium chlorid.

in the blood and tissues. Except in Case 12, no untoward symptoms suggesting acidosis were encountered, although quite often the combined carbon dioxid of the plasma was as low as from 22 to 25 per cent. by volume. The chlorin in the plasma rose from 390 to 468 mg. for each 100 c.c., an increase of from 4 to 25 per cent. above the upper limit of the normal. These

4. Bogert, L. J., and Plass, E. D.: I, The Calcium and Magnesium Content of Fetal and Maternal Blood Serum, J. Biol. Chem. **56**: 297-307 (June) 1923. Folin, Otto: A System of Blood Analysis: A Revision of the Method for Determining Uric Acid, ibid. **54**: 153-170 (Oct.) 1922. Folin, Otto; and Wu, Hsien: A System of Blood Analysis, ibid. **38**: 81-110 (May) 1919. Kramer, Benjamin; and Tisdall, F. F.: A Clinical Method for the Quantitative Determination of Potassium in Small Amounts of Serum, ibid. **46**: 339-349 (April) 1921; A Simple Method for the Direct Quantitative Determination of Sodium in Small Amounts of Serum, ibid. **46**: 467-473 (May) 1921; A Simple Technique for the Determination of Calcium and Magnesium in Small Amounts of Serum, ibid. **47**: 475-481 (Aug.) 1921. Osgood, E. E., and Hoskins, H. D.: A New Permanent Standard for Estimation of Hemoglobin by the Acid Hematin Method, ibid. **57**: 107-110 (Aug.) 1923. Smith, Millard: The Determination of Chlorides in Trichloro-Acetic Acid Filtrates from the Whole Blood and Plasma, ibid. **45**: 437-447 (Feb.) 1921. Van Slyke, D. D., and Cullen, G. E.: A Permanent Preparation of Urease, and Its Use in the Determination of Urea, ibid. **19**: 211-228, 1914; Studies of Acidosis: I, The Bicarbonate Concentration of the Blood Plasma, Its Significance, and Its Determination as a Measure of Acidosis, ibid. **30**: 289-346 (June) 1917.

5. Haldane, J. B. S.: Experiments on the Regulation of the Blood's Alkalinity, J. Physiol. **55**: 265-275 (Aug.) 1921.

striking changes in the carbon dioxid capacity and chlorin content of plasma were present in from five to ten days after the administration of ammonium chlorid was begun, or approximately after the ingestion of from 50 to 100 gm. (10 gm. daily being the usual amount taken). A high concentration of chlorin in the plasma (438 to 468 mg.) occurred in Case 4, during periods when the excretion of chlorin in the urine was distinctly less than the intake.

Determinations of the concentration of several of the ions in the serum before and after a spontaneous diuresis were carried out in Case 1 (Table 3). No

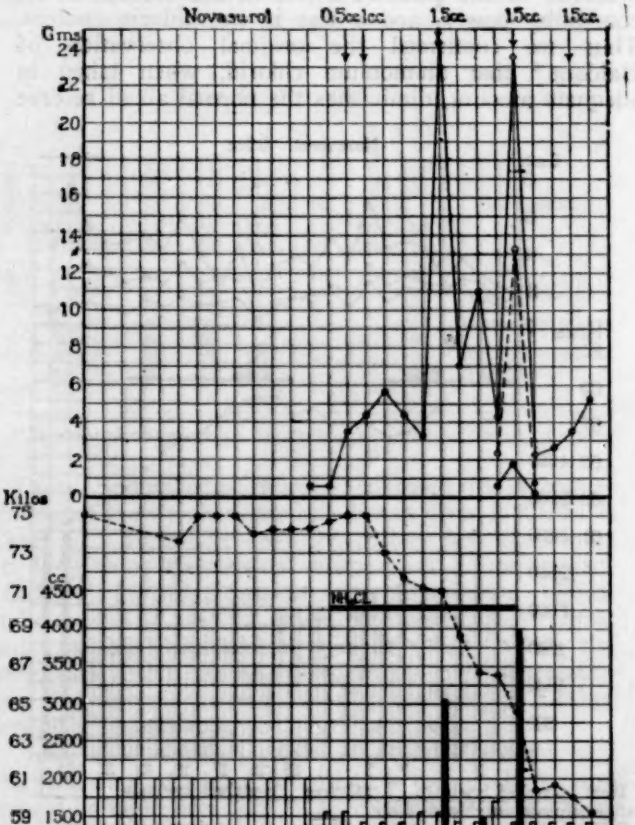

Chart 3 (Case 10).—Diuresis with ammonium chlorid and novasurol.

striking changes were noted. In Case 2 (Table 3) there was a slight fall in the concentration of sodium after the diuresis of ammonium chlorid. These few estimations indicate that the concentrations of the fixed bases in serum are very little altered by the active diuresis instituted by ammonium chlorid, as pointed out by Gamble, Blackfan and Hamilton.[5] We have also noted similar slight changes in cases of ascites subjected to marked diuresis with novasurol.

One would not expect a rise in the concentration of urea in the blood after the ingestion of a large amount of an ammonium salt. A slight rise did occur in Case 11, from 13 to 22 mg., a greater rise in Case 9, from 23 to 39 mg., and a marked rise in Case 12. No such relationship was noted in the remaining nine cases. These results would indicate that a sustained rise in the concentration of urea in the blood after the ingestion of ammonium chlorid can only mean a failure of the renal cells to excrete urea normally. However, the lack of available water in the organism rather than actual renal injury may be a factor causing these increases in blood urea.

Urine.[6]—Chemical studies on the urine included estimation of the hydrogen ion concentration, the ions (chlorin, sodium, potassium, calcium, magnesium and phosphorus), and the total nitrogen, urea and ammonia.

In spontaneous diuresis occurring during the course of renal disease, the hydrogen ion concentration of the urine may vary between 5.0 and 7.7 (Cases 1 and 2, Tables 4 and 5). However, in the diuresis produced by ammonium chlorid in this series of cases the hydrogen ion concentration of the urine was always below 6.0, varying from 5.8 to 4.6, the urine becoming decidedly more acid in from two to six days after the ingestion of ammonium chlorid began. In the course of Case 9, it was necessary to give about 160 gm. of ammonium chlorid or calcium chlorid in sixteen days before the reaction of the urine reached a hydrogen ion concentration of 5.0. This patient failed to show a satisfactory diuresis or loss of weight.

In this series, the carbon dioxid capacity of the plasma decreased at approximately the same time as the hydrogen ion concentration of the urine increased. However, in Case 2 (Table 5), on two occasions, the plasma carbon dioxid was not markedly lowered (43 and 36 per cent. by volume), and the hydrogen ion concentration of the urine increased only from 6.4 to 5.2, even after the patient had been taking 9 gm. of ammonium chlorid daily for from five to eighteen days. It should be noted that during these two periods, the excretion of chlorin in the urine was distinctly greater than that of the fixed bases, when both chlorin and fixed base are expressed in terms of a tenth normal acid or alkali. It should also be noted that the output of ammonia in the urine was markedly increased.

The detailed quantitative studies of the excretion of the different ions in the urine were particularly interesting because of the constant daily diet (low in salt content), and the accurately measured amounts of ammonium chlorid and novasurol. On four occasions during periods of spontaneous diuresis, several of the different ions were determined quantitatively in the urine. In every instance the concentration of chlorin was low, from 0.14 to 0.53 gm. per cent., but the total twenty-four hour output exceeded the intake. The excretion of sodium likewise exceeded the intake, and the concentration varied from 0.13 to 0.37 gm. per cent. Similar urinalyses after the ingestion of ammonium chlorid were carried out during five periods in three patients. In Case 2, first period (from Oct. 4 to Oct. 8, 1924), the chlorin concentration rose to 0.98 gm. per cent., and the total excretion exceeded the intake by 5 gm. But under similar conditions at a later date, in Case 2, second period (from March 14 to May 17, 1925), and in Cases 4 and 11, the concentration

6. Bogert and Plass (Footnote 4). Briggs, A. P.: A Modification of the Bell-Doisy Phosphate Method, J. Biol. Chem. **53**: 13-16 (July) 1922. Gillespie, L. J.: Colorimetric Determination of Titration Curves Without Buffer Mixtures, Am. Chem. Soc. Jour. **42**: 742-748, 1920. Harvey, S. C.: The Quantitative Determination of the Chlorids in the Urine, Arch. Int. Med. **6**: 12-18, 1910. Tisdall, F. F., and Kramer, Benjamin: Methods for the Direct Quantitative Determination of Sodium, Potassium, Calcium and Magnesium in Urine and Stools, J. Biol. Chem. **48**: 1-12 (Sept.) 1921. Wong, S. Y.: The Use of Persulfate in the Estimation of Nitrogen by the Arnold-Gunning Modification of Kjeldahl's Method, ibid. **55**: 427-430 (March) 1923.

remained low and the total output being much less than the intake, indicated a retention of chlorin. During these periods of retention of chlorin, on the contrary, the excretion of sodium, with only a single exception, greatly exceeded the intake. The intake and output of potassium balanced closely except in Case 11, in which there was a like retention of all three ions, chlorin, sodium and potassium. The daily excretion of potassium in these cases showed much less variation than the sodium.

The striking point regarding the excretion of phosphates during diuresis was the fall in concentration with a constant total output. The amounts of calcium and magnesium excreted daily were small and showed considerable variation both in concentration and total excretion. On account of the small amounts of these ions in the urine, marked relative changes make little difference in the total excretion of bases.

Calculating the chlorin, and then the sodium and potassium together in terms of cubic centimeters of tenth normal acid or alkali, the quantitative relationship between them becomes of interest. In the spontaneous diuresis (Case 1, Chart 5), there was a marked preponderance of the two bases over chlorin. A similar, but lesser, preponderance of these bases was seen in the diuresis produced by ammonium chlorid (Case 4, Chart 5).

With the diuresis following the injection of novasurol there was no constant change in the urinary hydrogen ion concentration. There was invariably a rise in the concentration and total excretion of sodium, a rise in the total output of chlorin, with usually a rise in its concentration. As a rule there was no definite increase in the excretion of potassium. The excretion of phosphate was characteristic: a fall in concentration with no change in the total excretion. Novasurol may cause a rise also in the total amount and concentration of calcium (Table 5). In Table 5 is shown the approximate total fixed base as calculated from the sum of the sodium, potassium and calcium is shown in Table 5. With full novasurol diuresis, the excretion of the bases sodium and potassium together was approximately equivalent to that of chlorin (Case 10, Chart 5), when calculated in terms of tenth normal acid or alkali.

The total nitrogen determined in the urine, for a control period of six days in one case and eight days in another, averaged 6.57 gm. and 6.2 gm., respectively. The 40 gm. of protein in the diet yields 6.3 gm. of nitrogen. The same state of nitrogen equilibrium was reached on the fifth day by a normal person on the weighed low-salt diet.[7]

During part of the period of study of Case 2 (Table 5), urea nitrogen and ammonia nitrogen as well as total nitrogen were determined in the urine. It was found that, when ammonium chlorid was given, the total nitrogen increased to include approximately the 2.3 gm. nitrogen which 9 gm. of ammonium chlorid would yield. The average total nitrogen in the urine during fifteen days was 8.76 gm.; the nitrogen in the diet and that in ammonium chlorid together amounted to 8.6 gm. There was a slight but distinct increase in both the total urea and the ammonia nitrogen. The increase in ammonia nitrogen was most marked. It has been noted also in this patient, Case 2, that there is a tendency toward a decrease in ammonia nitrogen both in concentration and in total amount during diuresis produced by ammonium chlorid and novasurol.

7. Nitrogen determinations were not made on the stools. Even allowing for 10 per cent. elimination by the stools, this does not affect the general result.

COMMENT

The therapeutic objective in cases of edema is the removal of excess fluid from the body. When this is brought about, an increased excretion of urine or diuresis always occurs. Diuresis may start spontaneously without, but more usually after, dietary restriction or after the exhibition of certain drugs. Besides the increased volume of urine, the excretion of sodium is invariably increased, and the output greatly exceeds the intake. There is usually also a loss of chlorin and other ions, but not so constantly or invariably as that of sodium. Loss of sodium is thus a characteristic phenomenon associated with diuresis and loss of edema.

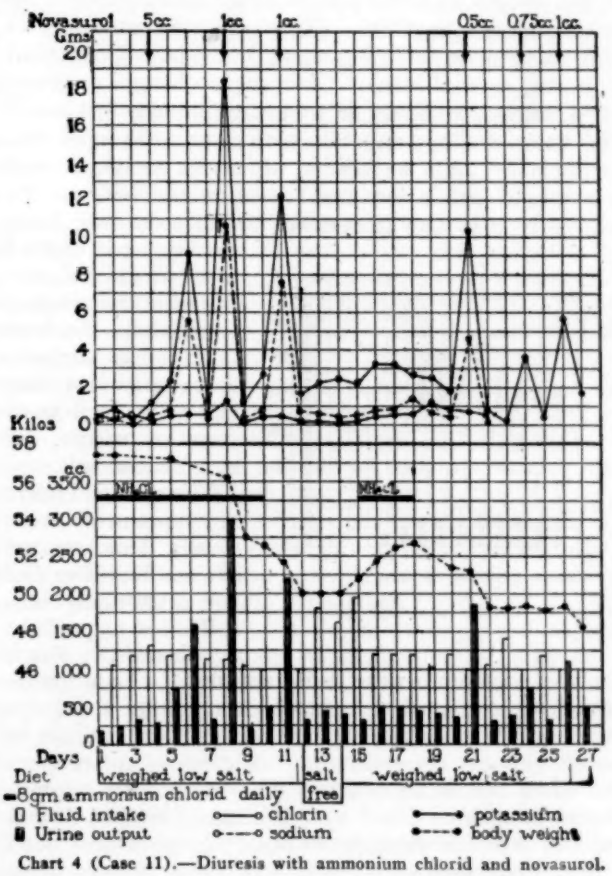

Chart 4 (Case 11).—Diuresis with ammonium chlorid and novasurol.

Meyer and Cohn [8] and Blum [9] were the first to emphasize the importance of the excretion of sodium when loss of body water occurred.

Spontaneous diuresis occurred in Case 1, and the findings agree with previous results obtained by Atchley, Loeb and Benedict,[10] and by us.[11] Here restriction to the weighed low-salt, low-fluid diet led to the onset of a satisfactory diuresis. The importance of this dietary measure was also seen during the treatment of two patients (Table 6, Charts 2 and 4). Fur-

8. Meyer, L. F., and Cohn, S.: Klinische Beobachtungen und Stoffwechselversuche über die Wirkung verschiedener Salze beim Säugling, Ztschr. f. Kinderh. **2**: 360-419, 1911.

9. Blum, L.; Aubel, E., and Hausknecht, R.: Calcium Salts in Nephritis, Bull. et mém. Soc. méd. d. hôp. de Paris **46**: 206-214 (Feb. 3) 1922.

10. Atchley, D. W.; Loeb, R. F., and Benedict, E. M.: Physiochemical Studies of Calcium Chlorid Diuresis, abstr., J. A. M. A. **80**: 1643-1644 (June 2) 1923.

11. Keith, N. M.; Barrier, C. W., and Whelan, Mary: Treatment of Nephritis and Edema with Calcium, J. A. M. A. **83**: 666-670 (Aug. 30) 1924. Keith, N. M., and Whelan, Mary: The Effect of Novasurol on the Composition of Blood and Urine, Am. J. Physiol. **73**: 195-196, 1925.

ther studies are contemplated to determine the relative importance of the low-salt and low-fluid content in this diet.

Detailed studies of the diuresis brought about by ammonium chlorid and the low-salt, low-fluid diet were carried out in Case 4 (Table 6). The urinary excretion of water and sodium was increased in spite of evidence of retention of chlorin. The proportionate loss of sodium over chlorin was not so marked as found in Case 1, with the spontaneous diuresis (Chart 5). These findings would indicate that the edema fluid in Case 4 was more difficult to dislodge, yielding only after the exhibition of the combined effects of diet and ammonium chlorid. The exact importance of the decreased alkali reserve and increased chlorin content of the tissues as factors in bringing about the diuresis is difficult to appraise. Both changes occurred in Case 9 without bringing about diuresis. This result suggested a renal block. Only slight changes occurred when diuresis and loss of weight took place in Case 2. The latter finding, together with a simultaneous, proportionately high excretion of urinary chlorin and ammonium with a low fixed base, would indicate the possibility that the ammonium radical was not being readily converted into urea, but excreted in the urine as ammonium. Such an explanation suggests that ammonium chlorid may, in certain cases of edema, act as a neutral salt.

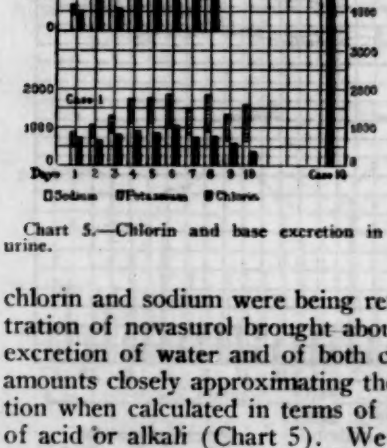

Chart 5.—Chlorin and base excretion in urine.

The specific effects of novasurol were clearly demonstrated in Case 11. The diet and ammonium chlorid failed to produce a diuresis. Both chlorin and sodium were being retained. The administration of novasurol brought about a prompt and large excretion of water and of both chlorin and sodium in amounts closely approximating their equivalent proportion when calculated in terms of tenth normal solution of acid or alkali (Chart 5). We have evidence in this and also in a further series of cases that novasurol, even if previously ineffective, will produce a diuresis after the ingestion of ammonium chlorid. In certain cases, the increase in chlorin rather than the decrease in alkali reserve in the tissues appears to be the important factor in producing the combined effect.

SUMMARY

A group of patients having nephritis with edema, selected on account of their inability to excrete salts and water, were treated with controlled diets, ammonium chlorid and novasurol. In most cases the immediate results were very satisfactory. The combined effects of diet, ammonium chlorid and novasurol produced beneficial effects when singly each was ineffective. Thus therapeutic results, never previously possible, have been obtained.

Diuresis, in cases of edema, is associated with increased excretion of sodium whether it occurs spontaneously or following the exhibition of ammonium chlorid or novasurol.

POOR SURGICAL RISKS

LABORATORY ASSISTANCE IN PREPARATION OF PATIENTS FOR OPERATION AND IN THEIR POSTOPERATIVE CARE *

WILLIAM THALHIMER, M.D.
MILWAUKEE

In this summary, all that can be attempted is a brief discussion of some of the results obtained by laboratory investigations of several types of patients for whom the hazard of a major surgical operation is more serious than for the average patient. This discussion will be of laboratory data, their significance, and their indications for certain preoperative and postoperative treatment of these patients.

In the beginning, let me confess that nothing new is presented, but, on the contrary, I must recall something which is very old and with which all are familiar. When Lister had perfected his antiseptic technic, the surgeons who visited his clinic are said to have commented, "This elaborate method is possible in Lister's operating room, because of the unusual energy, care and enthusiasm present there; but such infinite care of detail will not be possible in other surgeries." This opinion has been completely disproved by experience. Today there is scarcely a hospital, no matter how inadequate it may be in a number of directions, that hasn't a thoroughly reliable operating room technic. The probable reason for this is that asepsis is a surgical necessity, and what is necessary is accomplished. Since most patients will recover after proper aseptic operations, regardless of the kind of postoperative care they receive, or of attention to the functional ability of the heart, kidneys or other organs, it is unfortunately true that these matters do not receive the consideration they should. And yet if a complicated operating room technic can be maintained, efficient laboratories and postoperative care can be maintained also. Whereas surgery will probably never again achieve the degree of progress made possible by Lister's discoveries and work, it can surely accomplish many more cures than it does today, by extending the same degree of accuracy found in the modern operating room to the hospital laboratory and to the preoperative and postoperative sick room.

The sort of patients under discussion are not those facing an emergency operation, for with these there is no choice, since their condition demands immediate surgical treatment. There is also no time for a thorough laboratory investigation, and usually a lack of time to attempt the improvement of the patient's condition and of his chances for resisting his disease and withstanding the effects of the anesthesia and operation. Nevertheless, some of the kinds of treatment to be discussed are particularly applicable to the so-called "emergency case," especially after operation.

The group of patients with which we are especially concerned in this symposium is made up of persons who need operative treatment either to save their lives or to correct a condition that interferes seriously with their health or activity. Their surgical disease does not demand urgent operative treatment but allows time for careful study and preparation for operation.

* From the laboratories of Columbia Hospital.
* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

Under methods of study are included careful clinical investigation (which is most important) and laboratory aids with chemical, bacteriologic, physiologic, roentgenologic, electrocardiographic and other methods.

In general, the person who is confronted with a greater than average hazard in submitting to a major surgical procedure (I have in mind particularly abdominal operations) is beyond middle age, and possesses a heart with subnormal functional ability (myocardial inefficiency) and kidneys whose function is also compromised. Special subgroups will include patients of any age with mild or marked anemia; with dehydration because of either diarrhea or considerable vomiting; with incomplete pyloric or intestinal obstruction; with either alkalosis or acidosis, or with any number of other conditions that cannot be classified conveniently.

I wish to make a plea not only for the study of these patients with laboratory methods, but especially for the interpretation of laboratory findings by a person who is capable of interpreting them, be he a surgeon, an internist or a laboratory worker. Persons with this ability are not numerous, for such is acquired only by clinicians who are trained in the laboratory and who keep in touch with this field, or else by laboratory workers who are also clinicians.

This special ability, it seems to me, is particularly necessary in interpreting the degree of seriousness of cardiac abnormalities. The usual classification of cardiac disease into organic and functional is satisfactory, but the common opinion that an organic heart disease is a more serious handicap to a person about to undergo an operation than a functional heart disease is undoubtedly erroneous. The reason for this is that most surgeons believe that cardiac abnormalities which can't be detected by ordinary physical examination are not organic but functional, and should be treated with the same contempt which they give to functional nervous diseases. As a matter of fact, it is immaterial how loud a murmur a patient's heart makes so long as this lesion is compensated, and the heart has sufficient reserve to function adequately during the stress of a major operation and the postoperative period. With the possible exception of severe disease of the aortic ring, it is my opinion that patients with compensated cardiovalvular disease withstand operations without undue risk, provided the myocardium is functioning adequately. It has been my experience that such patients pass through their operations smoothly, and do not succumb to cardiac failure after the operation unless the heart is exhausted by other factors, chief of which is renal failure. In other words, most postoperative cardiac deaths are postoperative renal deaths.

The cardiac reserve can be determined by various safe procedures which test the effect of given amounts of work on cardiac function, blood pressure, vital capacity, etc. The most important laboratory examination is made with the electrocardiograph. It is being realized more and more that the electrocardiograph is not merely a research instrument, but that it gives accurate knowledge of the functioning of the heart. This has been pointed out by Wilson.[1] All patients of middle age or over should be studied with this means before operation, and those who show a marked lengthening of conduction time should be operated on only after thorough digitalization, and then only if the surgical treatment is imperative. Many such patients stand an operation well, but about twenty-four hours later, their heart rate begins to increase, and continues to increase till the compromised myocardium becomes exhausted. This change in conduction may be caused by endocardial sclerosis, and the arborization block of Oppenheimer and Rothschild[2] by fibrosis in the myocardium, or other lesions, practically all of which are due to coronary artery disease. Myocardial weakness, unsuspected clinically, is at times revealed by an electrocardiogram. Geist[3] considers that efficiency of the myocardium is so important that in a large group of patients he has given digitalis as a routine before operations, and he reports fewer postoperative pulmonary complications, and a smoother convalescence. If digitalis is given, enough must be administered to cause its physiologic effect on the heart; that is, complete digitalization. Fortunately, we know that this can be accomplished very rapidly by giving one of a number of preparations intravenously in large doses. At Columbia Hospital we use the ordinary tincture of digitalis.

Probably the factors which influence the postoperative course of patients more than any others are those which have to do with renal function. The only patients we need consider here are those for whom special methods or special clinical acumen are necessary, in order to discover renal insufficiency before operation and to render the proper kinds of treatment. Although an increased blood pressure does not necessarily indicate organic renal disease, it will be found that most patients with this condition show subnormal renal function after operation. The simplest test for kidney function, and one of the best, is the urea concentration test of Mosenthal. The phenolsulphonephthalein test is useful in some instances, but not in all. Chemical examination of the blood is most important, for evidences of retention of nonprotein nitrogenous substances (urea, creatinin, etc.) are of great significance. Furthermore, the determination of the quantitative secretion of urea is not given the attention it deserves.

It is my conviction that the most important means of effectively maintaining sufficient diuresis is by furnishing the body with sufficient water. If this is done, and granting that the circulation is adequate (as it usually is), that the oxygen carrying power of the blood is normal so as not to compromise the actively functioning kidney cells by oxygen want, and that sufficient carbohydrate is being furnished to the body so as not to cause it unnecessarily to break down its own protein and so throw into the circulation an excess of nitrogenous substances, then one has given the kidneys their maximum opportunity, and various so-called diuretics probably will not give further help. It might seem radical to state that the simplest and safest way to give fluids to a very sick patient is by intravenous injection. Nevertheless, I believe there are some good reasons for not giving by mouth or by rectum the large amounts of fluids that may be necessary to these patients, since with these patients the absorption by either of these routes is questionable, and either manner of administration at times causes vomiting and gastric and intestinal distention. Fluids can be given very satisfactorily by duodenal tube to some patients, but it is at best a distressing maneuver for the patient. The patients suffer less pain from an intravenous than from a subcutaneous

1. Wilson, F. N., and Herrmann, G. R.: Ann. Clin. Med. **3**: 419 (Dec.) 1924.

2. Oppenheimer, B. S., and Rothschild, M. A.: Electrocardiographic Changes with Myocardial Involvement, J. A. M. A. **69**: 429 (Aug. 11) 1917.

3. Geist, S. H.: Am. J. Obst. & Gynec. **4**: 30 (July) 1922.

injection. Fluids can be, and should be given slowly into the vein at a rate of from 200 to 500 c.c. an hour. The continuous drip method of Matas [4] is excellent, though it is our custom to give fluid at intervals, as is indicated by the condition of the patient.

Many of the patients whose cases we are discussing who have only a slight degree of anemia, such as would cause no concern in the average patient, should receive transfusions both before and after operation. A normal supply of oxygen to all tissue cells, as well as to those of the kidneys, is of extreme importance and can be maintained by the simple procedure of one or more transfusions. Ward,[5] and others, have emphasized this, and their work cannot be too highly recommended. No particular method of transfusion can be recommended, except that unchanged blood is preferable and is less likely to cause a reaction than citrated blood.

Next in importance to these factors is the furnishing of adequate carbohydrate nourishment to the patient. Again, this can be accomplished safely by the intravenous route. Instead of the usual physiologic sodium chlorid solution, we give 100 gm. of dextrose a day in the form of either a 5 or 10 per cent. solution. Sometimes twice this amount is given. By this means, the most important energy giving constituent of food is supplied and is delivered into the circulation, where it is carried immediately to all the cells for either use or storage. Sparing the breakdown of body protein, when sufficient carbohydrate is available, has been mentioned. This has been demonstrated during acidosis by Harding and Potter.[6] We have also gathered the impression, though this cannot be proved as yet, that this procedure improves the action of poorly functioning hearts. Apparently the force of the cardiac contraction improves, and as a result the rate decreases. Our only explanation is that the glucose supplies the most essential metabolite used in the mechanism of muscle construction.

In addition to the foregoing, glucose, given at the rate described, produces one other important result. A small amount appears in the urine. This need not be feared, as it causes no injurious effect, but on the contrary a beneficial one. Next to water, glucose is the best diuretic available. Therefore, in patients in whom maintainance of renal function is of paramount importance, this diuretic effect of glucose is advantageous.

One group of patients present themselves for operation after they have been vomiting for a longer or shorter period of time. These patients are usually in extremely poor condition and have either an acidosis or an alkalosis. The presence of acetone and diacetic acid in the urine (ketonuria) usually indicates an acidosis, but these substances may be present during alkalosis. Other signs of acidosis are a lowered carbon dioxid combining power of the blood plasma (as determined by Van Slyke's method), diminished tension of carbon dioxid in the alveolar air (as determined by Marriott's method), and lowered p_H of the blood (as determined by Cullen's method). The most important definite signs of alkalosis are an increased carbon dioxid combining power of the blood plasma and an increased p_H value of the blood. None of these laboratory tests are difficult, but they demand an experienced and reliable chemical laboratory worker.

The seriousness of acidosis has been recognized for a long time, but only in recent years has the frequency and seriousness of alkalosis become known. It is of extreme importance to differentiate between these two conditions, as the proper treatment for one intensifies the other. Acidosis is the more common of the two, and yields to the same treatment when present either before or after operation.

At this point, mention can be made of the importance of the choosing of the kind of anesthetic to be used. It is always important to choose one that is least likely to intensify or create acidosis. Local anesthesia, or ethylene with an ample supply of oxygen, are to be given first choice. Next in order are nitrous oxid and oxygen and, finally, ether. The limitation of time forbids discussion of the reasons for this selection.

One of the most important causes, if not the chief cause, of acidosis is the body's deficient utilization of carbohydrate. This happens for different reasons; in diabetes, because of an abnormality in the mechanism of carbohydrate metabolism; in anoxemia, because of a deficiency of oxygen supplied to the tissue cells (as shown by Loevenhart and his co-workers [7]); in starvation, as from vomiting or other causes, because of an insufficient supply of carbohydrate nourishment, and so on. The essential cause of the acidosis must be treated; but since this is usually a deficient utilization of carbohydrate, in most instances all that is required is to furnish carbohydrate to the tissues, and, if necessary, aid the mechanism of utilizing this food. The carbohydrate can be most rapidly and easily furnished by giving a solution of glucose intravenously. Its utilization can be speeded up, even in the nondiabetic patient, by giving insulin hypodermically at the same time. Acidosis due to insufficient utilization of carbohydrate can be cleared up in a few hours by these means. Alkali therapy is necessary only for the condition of noncompensated acidosis, and probably this is its only indication.

A discussion of the treatment of anoxemia requires more time than is at my disposal.

Alkalosis is most commonly encountered in patients with marked pyloric or intestinal obstruction and vomiting, causing a loss of hydrochloric acid, or after excessive dosage with sodium bicarbonate. Alkali therapy and gastric lavage are definitely contraindicated, and instead of hydrochloric acid, ammonium chlorid or sodium chlorid should be given. This condition will be discussed by Orr and Haden.[8]

Another field for the use of the injection of glucose intravenously and insulin hypodermically is that formed by patients who have not withstood an operation well or whose postoperative condition is poor, even in the absence of an appreciable acidosis. We have been using this method of the treatment for two years at Columbia Hospital in this group of patients. This condition is not that of shock; in fact, we rarely see a true condition of operative or postoperative shock. Nevertheless, the poor general condition of these patients often improves quite rapidly following this treatment. The slow intravenous injection of a solution of glucose, at the rate already advised, has not, in my experience, caused any immediate rise in blood pressure. The improvement in a patient's condition cannot be the effect of an

4. Matas, Rudolph: Ann. Surg. **79**: 643-661 (May) 1924.
5. Ward, G. G.: Wisconsin M. J. **23**: 489 (Feb.) 1925.
6. Harding, V. J., and Potter, C. T.: Brit. J. Exper. Path. **4**: 105 (June) 1923.
7. Loevenhart, A. S.; Brunquist, E. H., and Schneller, E. J.: J. Biol. Chem. **62**: 93 (Nov.) 1924.
8. Haden, R. L., and Orr, T. G.: J. Exper. Med. **38**: 55 (July) 1923; **39**: 321 (Feb.) 1924; **41**: 107 (Jan.) 1925; Use of Sodium Chlorid in Treatment of Intestinal Obstruction, J. A. M. A. **82**: 1515 (May 10) 1924; Surg., Gynec. & Obst. **37**: 465 (Oct.) 1923.

increase in blood pressure, but, on the contrary, any rise in blood pressure that may occur will be the result of the patient's general improvement. Therefore, one cannot expect to increase the blood pressure in true shock by this treatment, nor do I advise this manner of treatment for shock. The problem of shock is a separate subject, and cannot be discussed here.

In this brief summary, only a few of the most important considerations could be presented. The recommendations that are indicated can be summed up finally in a plea which has been made many times before, and by much abler supplicants than I. It should have produced its effect wherever medicine and surgery are practiced. Unfortunately, except in a comparatively few large clinics, it has fallen on unresponsive ears.

Allow me to put in another plea for a realization that impaired physiologic functions of patients demand as much consideration and treatment as their organic diseases. This can be accomplished by developing a physiologic point of view, and using physiologic methods of study and treatment. Finally, this will be possible only by the expenditure of intelligent energy, and when surgeons are sufficiently far sighted to secure at all times the close cooperation with them of internists, laboratory workers, interns and nurses.

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ABDOMINAL SURGERY IN DIABETES*

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It is undoubtedly true that the diabetic patient must be included among the bad risks in surgery, but is it not time for us to revise our estimate of the danger of operations to these patients? Our impressions are influenced too much by the results of surgery on diabetic patients previous to the work of Allen, Joslin and others. It should be remembered that our impressions are obtained largely from our experience with operations for carbuncles, gangrene and abdominal operations of dire necessity, and we should be well aware, from our experience with many other operative procedures, that the mortality in operations that are done only as a last resort is very high.

Those who gave special attention to diabetes deserve much credit for their treatment of surgical diabetes before the introduction of insulin, but their methods had not permeated very deeply into the profession. It has taken a great discovery, insulin, to stimulate the interest of the medical profession in these cases. This opportunity should therefore be grasped to readjust ourselves to a proper appreciation of the needs of this group of cases.

Some of the reasons why diabetic patients are bad surgical risks are:

1. The majority are old, and already damaged.
2. Their resistance to infections is low.
3. Tissues do not heal well in the presence of faulty carbohydrate metabolism indicated by a high blood sugar.
4. Serious diabetic conditions frequently develop following operation.

Joslin shows by several series of collected cases that 51 per cent. of the cases of diabetes occur between the ages of 50 and 70 years. In addition to this the diabetes has already damaged their circulatory system and kidneys to a much greater extent than is the case in the average person of that age. We must therefore compare the results of surgery in these cases with a group, 51 per cent. of whom average 60 years old, and in whom there is a high percentage of damaged circulatory systems and kidneys. That these patients have a lowered resistance to infection cannot be denied. While this has not been proved experimentally, it is an undoubted clinical fact. But it must be remembered that our impressions here are gained largely from our experience with infections of the extremities in which the circulation is damaged to a large extent. We have experimental[1] as well as clinical proof that wounds do not heal well in the presence of a high blood sugar. While it is true that the use of insulin improves the utilization of carbohydrate and for that reason permits wounds to heal that would not have healed formerly, we must not be led into believing that insulin alone will improve the circulation of the extremities with advanced arteriosclerosis. We believe that there are no clinical data to warrant this belief. In abdominal surgery, we need have no fear of an impaired circulation locally, and with insulin no fear of the wound not healing, except in the presence of infection.

The possibility of serious diabetic complications following operation is always present, but fortunately we are equipped at the present time with various means of preventing these conditions. These are: (1) comprehensive cooperation between the surgeon and the internist; (2) careful preoperative study and preparation; (3) judicious selection of the anesthetic and the operation; (4) vigilant postoperative care by the internist as well as by the surgeon, and (5) insulin.

It must be evident to all that the surgeon cannot possibly have the experience in the care of diabetic patients that the internist has, and it would be a useless duplication of effort for him to attempt it, provided an experienced internist and, one might add, one interested in these cases, is available. It might well be said by the internist that it is just as important to have a surgeon who is interested in these cases. At least, let us hope that we will never return to the days when the family physician thought he knew how to care for these patients and felt that it was useless to attempt any surgery on them. There are still, we are sure, many appendix and gallstone patients not operated on because of the feeling among physicians that operations should not be performed on diabetic patients. In fact, in a series of necropsies reported by Warren and Root, gallstones were present in six patients out of twenty-one over 25 years of age, and chronic cholecystitis with obliteration of the gallbladder in a seventh.

The anesthesia used is of the greatest importance in diabetes. Not only must we select an anesthetic that will do the least possible harm to the diabetic condition, but also we must select one that will permit us to do the necessary operation with the least possible injury to the tissues. Ether, which is the anesthetic of choice for the great majority of surgeons, undoubtedly permits us to operate with the greatest ease and to do the least possible injury to tissues, but it is, we

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

1. Lewis, M. R.: J. Exper. Med. 35: 317 (March) 1922.

feel convinced, a dangerous anesthetic to use in diabetes. Because at the Mayo Clinic they can use ether with the excellent results which they report, we should not attempt to follow their example unless we can do the operation in as short a time with as little ether, and with the same care in handling tissues as they. Ether administered to normal persons or animals gives rise to a hyperglycemia and acidosis. Sansum and Woodyatt [2] have shown this increased blood sugar to have its origin in liver glycogen. Bloor [3] found a rise in blood fat during ether anesthesia of normal dogs, varying from 40 to 100 per cent. Moreover, it is a well known clinical fact that there is more nausea and vomiting after ether than after nitrous oxid and oxygen, spinal anesthesia or local anesthesia. The reduction of nausea and vomiting to a minimum is of great importance because of its interference with the intake of food and liquids. Vomiting increases the tendency to ketosis. We are of the opinion, therefore, that Joslin's statement still holds good—that "ether anesthesia is a burden which a light case of diabetes may easily bear, which may change a moderate to a severe case, and to a severe case prove fatal." [4] If we are to use a general anesthetic, nitrous oxid or ethylene and oxygen is the anesthetic of choice. We should place one condition on its use; that is, the patient must be so anesthetized that the operation can be carried out without trauma to the abdominal wall or viscera. This can be accomplished at times by the addition of local anesthesia, but at times the addition of ether is necessary. If the anesthetist thinks the patient will require much ether to control him, we much prefer to start the operation with local anesthesia, using a light ether anesthesia to control the patient if necessary during the difficult part of the operation. Then we remove the ether and finish the operation with local anesthesia alone. This method has proved very satisfactory in certain gallbladder operations.

Spinal, local, paravertebral, sacral and parasacral anesthesia should be the anesthesia of choice in diabetic conditions. The effect of the anesthetic is reduced to its lowest possible level by these methods, and undoubtedly they permit a higher percentage of recoveries than any other method. If one would be convinced of the foregoing statement, he should employ the various methods of anesthesia in a series of cases.

Probably the most important factor in the outcome of surgical conditions in diabetic patients is the preoperative and postoperative care, which we believe in placing largely in the hands of the internists—and an internist interested in diabetes. The routine care of the patients, preoperative and postoperative, as carried out at the New England Deaconess Hospital under Dr. Joslin's care is taken largely from a paper on surgical treatment of gallbladder disease in diabetes,[5] with a few changes made to bring it down to date.

ROUTINE CARE

In preparing the diabetic patient for operation, radical procedures designed to render the patient sugar-free may cause actual damage by depleting the glycogen content of the liver and other tissues, and thus impoverishing a valuable protective agency. It may even be desirable to have small amounts of sugar in the urine at the time of operation, for then depletion of the carbohydrate reserve seems less likely to occur.

Acidosis is much more dangerous than large amounts of sugar in the urine. Unless operation is imperative, it should be delayed until the acidosis is controlled. In emergency cases, operation may be successfully performed in the presence of acidosis, but the responsibilities of the surgeon and internist are thereby greatly increased and the prognosis proportionately poorer. From the point of view of operability, diacetic acid in the urine is a satisfactory index of acidosis.

Adequate fluid intake is essential. The patient's tissues should be neither dehydrated nor water-logged, for either condition may prevent proper metabolic response to the unusual burden imposed by the operation. Unless the patient is very dry and dehydrated, from 2 to 3 liters of fluid a day for two days is probably adequate preparation. If the fluids cannot be retained when administered by mouth, they may be given by rectum, subpectorally or intravenously.

The diet should contain from 80 to 100 gm. of carbohydrate each day for at least two days immediately preceding the operation. The protein should not exceed 1 gm. per kilogram of body weight of the patient. The fat content of the diet should be low, thereby diminishing the possibility of ketosis by limiting the number of fat radicals to undergo incomplete splitting. From 50 to 75 gm. of fat a day is adequate, and in some cases much less may be given. The diet given in the accompanying tabulation adequately meets the preoperative requirements of the average gallbladder patient who is not too ill to eat. It contains approximately 100 gm. of carbohydrate, 45 gm. of protein and 58 gm. of fat.

Diet for Use Before Operations on Gallbladder

Breakfast	*Dinner*	*Supper*
One-half grapefruit	One small piece of meat	One egg
One large dish of oatmeal	One Uneeda biscuit	One Uneeda biscuit
Three ounces of milk	One small butter ball	One small butter ball
One egg	Two ounces of milk	One shredded wheat biscuit
One Uneeda biscuit	One small orange	Three ounces of milk
One small butter ball		One small orange

Tea, coffee, cocoa shells and saccharin as desired.

If the patient is too ill for this menu, carbohydrates must be persistently administered in small increments in the form of liquids given by mouth and by rectum. Two 6 ounce rectal injections of 10 per cent. glucose solution, 10 ounces of orange juice, a pint of oatmeal water gruel and half an ounce of levulose sugar in tea or in the gruel are equivalent to 101 gm. of carbohydrate, and we have experienced no difficulty in administering these slowly throughout the twenty-four hours. The oatmeal water gruel is made by reheating 8 ounces of cooked oatmeal, the equivalent of 1 ounce of dry oatmeal, in 1 pint of water, straining out the husks and diluting the gruel to the desired consistency. We have never found it necessary to resort to the intravenous injection of glucose. Insulin should be used to prevent undue accumulation of sugar in the urine. Two hours before operation, 5 ounces of orange juice is given by mouth.

On the day of operation, the usual morning dose of insulin should precede by thirty minutes the 150 gm. of orange juice given two hours before operation. To give large doses of insulin just before the operation is both unwise and unnecessary. The production of sugar

2. Sansum, W. D., and Woodyatt, R. T.: J. Biol. Chem. **21**: 1, 1915.
3. Bloor, W. R.: J. Biol. Chem. **19**: 1, 1914.
4. Joslin, E. P.: Treatment of Diabetes Mellitus, Philadelphia, J. B. Lippincott Company, 1923, p. 626.
5. Jones, D. F.; McKittrick, L. S., and Sisco, D. L.: Surgical Treatment of Gallbladder Disease in Diabetics, Boston M. & S. J. **191**: 709 (Oct. 16) 1924.

and acid can be adequately controlled after the operation, and it is unnecessary to subject the patient to the dangers of hypoglycemia. Insulin should be used to control the amount of sugar and diacetic acid in the urine and to enable the patient to take from 80 to 100 gm. of carbohydrate each day, but no more should be expected of it before the operation.

After operation, minute attention to detail is essential, and for this reason a special nurse is very desirable, although not indispensable. The more diabetic training the nurse has had, the more intelligent will be her care of the patient; but any well trained nurse can carry out the simple procedures necessary. The usual watchfulness accorded the nondiabetic patient who has been operated on should be redoubled for the diabetic patient. Nothing should be left undone to make him comfortable and to relieve him of every conceivable burden, for he will convalesce in direct proportion to the size of the load he is called on to carry.

A single specimen of urine is obtained every three or four hours after the operation and is tested for sugar by the Benedict test, and diacetic acid with ferric chlorid. If necessary, a self retaining catheter may be inserted and, in this case, specimens may be obtained at any interval. It is best not to delay more than three hours if any doubt exists about the patient's condition. If a catheter is used, hexamethylenamin should be administered. These single specimens, as obtained, are tested by the nurse, who then administers insulin on the basis of the qualitative results. The amount of sugar may be quantitated if desired, but this adds no helpful data. The single specimens should be carefully preserved in order that the twenty-four hour urine specimen may not be depleted.

Insulin is administered subcutaneously on the basis of the qualitative tests for sugar and diacetic acid in the urine. We have never found it necessary, in patients who have been operated on, to inject insulin intravenously. If the Benedict test for sugar is red, brown or yellow and no diacetic acid is present, 15 units of insulin may be given; but if diacetic acid also is present, 20 units may be administered. If the Benedict test is green, 5 or 10 units of insulin may be given. In general, more insulin may be safely given in the presence of diacetic acid than when it is absent. It is not necessary to follow each dose of insulin with carbohydrate ingestion. We make no effort to give enough carbohydrate after each dose of insulin to utilize all the insulin administered. When the insulin dose is carefully gaged against the sugar and diacetic acid in the urine, we have had no difficulty. We are, however, continuously feeding small quantities of carbohydrates, as will be shown later. These procedures may be carried out every one, two, three or four hours, depending on the urgency of the indications. We have had excellent success working on a three-hour schedule. We are not concerned if the patient does not become immediately sugar-free. Frequently this state is not reached for several days after operation. If the sugar and diacetic acid in the urine are under control and not increasing in amount, we are satisfied to work more conservatively, feeling that rapid changes in the metabolism of the patient are not always desirable. As convalescence progresses, the insulin requirements become less and less and it is often possible to dispense with it entirely.

Blood chemistry does not often play an important rôle in the postoperative care of a diabetic patient. Occasionally a patient is encountered in whom a knowledge of the blood sugar or the carbon dioxid combining power of the blood results in real benefit to the patient, but such cases are exceptional. We have not found it necessary to make blood sugar and carbon dioxid determinations a part of the postoperative routine. The simple tests for sugar and diacetic acid in the urine have usually supplied all the data necessary for adequate treatment. If urine specimens cannot be obtained, however, the blood offers the only other means of supplying the data necessary for the direction of the treatment.

The amount of fluid required after operation varies a great deal. Probably no patient should receive less than 1,500 c.c. during the first twenty-four hours. More may be given, depending on the degree of acidosis present and the general condition of the patient. We always put 6 ounces of tap water into the rectum every four to six hours during the first twenty-four hours following operation. The patients begin to take small amounts of water by mouth just as soon as they ask for it, but great pains are taken to prevent vomiting, for this usually produces acidosis. We try to attain a daily fluid intake of from 2 to 3 liters as soon as possible after operation. We have not yet found it necessary to use the intravenous route, but subpectoral salt solution has proved of great value.

During the first twenty-four hours after operation, we have found it desirable to administer from 40 to 60 gm. of carbohydrate. In cases showing considerable diacetic acid, it is advisable to give more insulin rather than to give larger amounts of carbohydrate. One pint of oatmeal water gruel containing one-third ounce of levulose supplemented by 10 ounces of orange juice, contains 60 gm. of carbohydrate. It is usually not difficult to feed these amounts in teaspoonful increments, but their volume may always be reduced by resorting to glucose solution by rectum. Equal parts of milk and vichy have proved very acceptable to some patients. Such a diet contains little fat and is therefore very desirable for the gallbladder patient. We give no thought to the protein content of the diet at this stage of the treatment. Sometimes the whites of two or three eggs are added to the orange juice, but this is done, not so much for the protein as to make the orange juice bland.

The day following operation, the diet remains almost the same as on the first day; but thereafter milk, cream, Uneeda biscuits, butter and eggs are added as rapidly as possible until the patient is taking his full maintenance diet. Meat, bacon, vegetables, and cheese are added very conservatively. In our experience it has taken from seven to ten days to reach a maintenance diet composed of the simple, easily digested foodstuffs. Bulk and overloading the stomach should be carefully avoided.

About 20 calories per kilogram of body weight is adequate for the average bed patient. We have found it unnecessary to feed 1 gm. of protein per kilogram of body weight in order to obtain rapid healing of the wound. As already indicated, the fat in the diet is kept at a low level during the convalescence of these gallbladder cases.

COMMENT

If all conditions as stated above can be carried out, what should be our attitude toward the diabetic patient? We believe that the advice given by Joslin to diabetic patients with gallstones can be applied to all abdominal conditions. He says, "In diabetic patients my advice is to have gallstones removed when the conditions of

time, place, surgeon and physician are propitious." We know of no limitations to be placed on the diabetic patient that should not be placed on the normal person—in other words treat the surgical condition, and after operation treat the diabetes.

A report of twenty-six diabetic necropsies by Warren and Root [6] brings out certain facts of importance in diabetic surgery. In the first place, the conception of the pancreas in diabetes as a static organ without tendency to regenerate is controverted by evidence showing that regeneration does occur in diabetes and may account for the long duration of favorable cases. With insulin treatment, evidence is definite that regeneration may occur. This should encourage the surgeon to remove foci of infection, not only because of their intrinsic danger but also because of their hampering influence on pancreatic regeneration.

In these necropsies the acinous tissue was found to be damaged as well as the islands of Langerhans. This is in accord with the work of Jones and his co-workers,[7] who have shown that in diabetes there is a marked alteration in the external secretory activity of the pancreas, and in the hepatic function. Among twenty-one necropsies on patients over 25 years of age, gallstones occurred six times and cholecystitis with obliteration of the gallbladder in a seventh. Furthermore, in only one of these patients had the gallstones been recognized during life. Cholecystitis and cholelithiasis should be sought energetically and treated promptly.

The first year of diabetes has long been known as the danger zone, because so many patients die then in coma. In such cases, at necropsy, little or no evidence of regeneration was found. This should warn the surgeon that diabetic patients, in the first year of the disease, need especial attention to prevent acidosis at the time of an operation.

Mild diabetes of long duration is occasionally regarded with contempt, especially in those past their youth. In this series, however, seven cases of mild diabetes of over fifteen years' duration showed most marked change in the islands of Langerhans. Of these patients, two with diabetes for twenty-five and thirty years developed severe acidosis when mild infections were not given prompt surgical treatment. Though mild, a diabetic patient is still diabetic, and consequently an easy prey to coma or septicemia.

It may be stated that, clinically, the removal of gallstones often gives the diabetic patient a new lease of life, his carbohydrate tolerance increases, and the improvement in general condition is marked. A young man with vague gastric symptoms and an occasional attack of epigastric distress could not be kept sugar free on an increasingly strict diet. Removal of a normal appearing gallbladder containing stones has made it quite easy to keep him sugar free on a much more liberal diet.

An important group of cases has been the gastric and duodenal ulcer group. A man, aged 47, with a long history of ulcer, and diabetes for a year and a half was unable to work for months. Within two months after a gastro-enterostomy he was at work and able to support a family of eight children. A man, aged 45, with duodenal ulcer and some pyloric obstruction, lost weight and strength until confined to bed. Fifty units of insulin and a C 50-P 70-F 100 diet would not keep him sugar free. After a gastro-enterostomy he left the hospital on a diet of C 80-P 63-F 150 without insulin, feeling well and gaining weight.

Patients from whom tumors of various kinds have been removed have shown marked improvement, but this is not always the case.

The most striking and most important group of cases are those in which septic foci, acute, subacute or chronic, are removed. The cholecystitis and appendicitis cases are the striking examples in which great immediate and permanent benefit is derived. In other words these patients are septic, and diabetes cannot improve in the presence of sepsis. Removal of the focus of infection changes the aspect of the case from that of a patient losing ground steadily to a comparatively healthy person in whom it is relatively easy to control the diabetes.

A woman, aged 40, with severe diabetes, emaciated and scarcely able to get about, was operated on for a chronic empyema of the gallbladder with few symptoms. A marked increase in carbohydrate tolerance took place and has remained constant for three years, and the patient has gained 40 pounds (18 kg.).

A man, aged 45, was kept in good condition with great difficulty for several years before an attack of acute gangrenous appendicitis. The appendix was removed and the abdomen drained. There was a marked increase in the carbohydrate tolerance as soon as the wound healed, and that tolerance has now been maintained for nine years.

But a more important reason for early operation than to increase the carbohydrate tolerance in the cases of acute infection is the great danger to the patient from the unrecognized seriousness of the infection. These patients do not react to pain or infection to the extent that a normal person does; the infection is therefore more likely to get beyond a localized area without recognition. These patients, we believe, are also more likely to general infections than the normal person. We have seen a case of appendicitis develop in the hospital under our supervision, and develop into a peritonitis rather gradually without its seriousness being recognized. We have operated on many patients who appeared to have simple gallstones, only to find markedly thickened and infected gallbladders and even chronic perforations. There is every reason why ulceration and infection in the gallbladder or appendix should go on as insidiously and with few symptoms as infections in other parts of the body in diabetic patients.

SUMMARY

We believe that the only additional consideration in deliberate operations on diabetic patients other than would be considered in normal persons is the ability to control the diabetes before operation.

In infections, acute and chronic, we believe that it is much more important to operate early than in the case of normal persons, and in acute cases the operation is more of an emergency than in the normal. They must be treated as emergency cases because of the difficulty of determining the seriousness of the lesion, and because acute infections quickly lead to serious diabetic conditions. The rule should be to operate first, and at once, in acute infection and treat the diabetes after the operation.

The future is brighter for the diabetic patient than ever before. Everything possible should be done to relieve him of extra burdens, for regeneration of the pancreas has been clearly demonstrated and all his resources are needed in this regeneration.

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REDUCING THE SURGICAL RISK IN SOME GASTRO-INTESTINAL CONDITIONS *

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As early as 1918, McCann [1] showed an increase in the alkali reserve of the blood in pyloric obstruction. Two years later, MacCallum, Lintz, Vermilye, Leggett and Boas [2] reported an increase in the carbon dioxid combining power of the blood plasma, and a fall in chlorids following sectioning of the pylorus in dogs. Hastings, Murray and Murray [3] studied the blood of dogs with pyloric obstruction and found that they all developed an alkalosis. Grant [4] noted a similar rise in the carbon dioxid combining power of the plasma and a reduction of the chlorids in two clinical cases of obstruction of the pylorus.

In acute intestinal obstruction, Tileston and Comfort [5] were the first to report an increase in the blood nitrogen. Cooke, Rodenbaugh and Whipple,[6] in experiments on dogs, also found a rise in the nonprotein and urea nitrogen. Draper [7] reports essentially the same findings, and Louria [8] and Rabinowitch [9] observed the same changes in clinical cases of intestinal obstruction, and emphasized the importance that these blood changes have in the differential diagnosis and prognosis of acute abdominal disease.

Our interest in the blood chemistry of gastro-intestinal tract obstructions began with a study of three patients who had quite marked reactions following gastro-enterostomy.[10] These patients were all quite seriously ill with rapid pulse, fever, dry tongue and, in one case, delirium. In each case, the blood showed a marked increase in nonprotein nitrogen, a fall in chlorids and an increase in the carbon dioxid combining power of the plasma. Two of the patients in whom the urine was studied showed a great increase in excreted nonprotein nitrogen and a reduction in the chlorids to a mere trace. The evident severe intoxication of these three patients was considered in each case due to a temporary duodenal obstruction at the gastro-enterostomy stoma or produced by a kinking of the intestine at the ligament of Treitz.

These findings were a stimulus to study the blood chemistry experimentally in pyloric [11] and upper intestinal [12] tract obstructions. The fall in the chlorids as indicated above suggested that they were in some manner utilized or destroyed during the toxemia. The possibility that the chlorids acted in a protective capacity led to experimental administration of sodium chlorid as a therapeutic agent.[13]

Dogs were used for most of the experiments. Rabbits and monkeys [14] were also used to check the blood chemical findings in dogs. Obstruction at the pylorus was produced by ligation with a tape. The development of toxemia was usually rapid and extreme. There was in all cases a rise in the blood nonprotein and urea nitrogen, a rise in the carbon dioxid combining power of the plasma, and a drop in the chlorids. In one instance, the chlorids dropped from 510 mg. per hundred cubic centimeters of blood to 110 mg. before the death of the animal. There was always a rise in the nonprotein nitrogen and diminution of chlorids in the urine. Obstruction of the duodenum and upper end of the jejunum were produced by section and inversion of the cut ends. Such obstructions produced chemical changes in the blood and urine similar to those of pyloric obstruction.

These changes in the blood are laboratory evidence of the degree of toxicity produced by the disease. It seems to us that of all the changes, the fall in chlorids is the most significant. What becomes of the chlorids is as yet unknown. It has been suggested that they are lost by vomiting, but this can hardly be entirely true, because rabbits show the same chemical changes and never vomit. We have attempted to prove that the chlorids in some way have protective power in combating the toxemia. In a series of four dogs with duodenal obstruction, 500 c.c. of 0.85 per cent. sodium chlorid solution was given daily by hypodermoclysis. These four dogs lived twenty-one, twenty-seven, twenty-eight and thirty days without the chemical changes in the blood characteristic of the toxemia of high intestinal obstruction. Dogs with obstruction in the same location without treatment died in from three to eight days. A series of three dogs were given 500 c.c. of distilled water daily in the same manner as the saline solution to determine the effect of water alone. These three dogs died in two, three and four days, a duration of life shorter than that observed in our dogs with like obstruction and no treatment. Other animals were permitted to develop the typical blood changes of toxemia following obstruction and were then given doses of hypertonic sodium chlorid from 3 to 25 per cent. In these animals the blood chemical changes could be returned to within normal limits by the administration of sufficient salt, regardless of the quantity of water given. This seems further evidence of the protective power of sodium chlorid against the toxin of intestinal obstruction.

In another series of experiments, we have noted the effect of distilled water and salt solution introduced directly into the intestine below a high obstruction of the jejunum.[15] Four dogs were given daily 40 c.c. of water per kilogram of body weight. The animals lived from two to eight days, developing the chemical changes in the blood characteristic of high intestinal obstruction. Three dogs were treated with 40 c.c. per kilogram of 1 or 2 per cent. sodium chlorid solution introduced into the jejunum below the obstruction. These dogs lived eighteen, nineteen and thirty days. One died of distemper on the nineteenth day, and another pulled the enterostomy tube from the jejunum, and it could not

* From the University of Kansas School of Medicine.
* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

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be replaced. The dog living thirty days died without the characteristic blood changes of intestinal obstruction. Three dogs were given distilled water after the development of the toxemia seemed imminent. They died in three, ten and eleven days, with a gradual fall in chlorids and a rise in the urea and nonprotein nitrogen. Animals were then treated with a 10 per cent. sodium chlorid solution directly into the intestine after the beginning of the toxemia. They lived sixteen, eighteen, nineteen and eight days. The dog living only eight days had a nonprotein nitrogen of 129, urea nitrogen 64, and chlorids 290 at the time treatment was begun. It seems probable to us that in some of the very toxic cases, so much damage may be done to the kidneys and other vital organs that no treatment would have effect even though the development of toxic bodies might be arrested.

In order to make our experiments simulate as closely as possible clinical cases of intestinal obstruction, we have carried out experiments on forty-eight dogs with obstruction of the jejunum [16] approximately 12 inches below the ligament of Treitz. Nine dogs had no treatment of any kind, eight had lateral anastomosis, six had distilled water only, seven had lateral anastomosis and 2 per cent. sodium chlorid subcutaneously, ten had lateral anastomosis and treatment with a salt mixture of sodium chlorid, ammonium chlorid, calcium chlorid and potassium chlorid, five had lateral anastomosis and 10 per cent. sodium chlorid intravenously, and three had lateral anastomosis and 25 per cent. salt solution intravenously. The nine dogs given no treatment all died in from two to six days. In the eight dogs, the lateral anastomosis was usually done on the third or fourth day after the obstruction. These animals were allowed water ad libitum. All died following the second operation with a continuation of the toxemia. The six dogs given 40 c.c. of distilled water per kilogram of body weight all died in from one to five days. Lateral anastomosis was not done. Of the seven dogs treated with lateral anastomosis and 2 per cent. salt solution subcutaneously, five lived, one died with peritonitis, and another died with a large abscess at the site of the saline injections. Two of the ten dogs treated with lateral anastomosis and 1 per cent. salt mixture subcutaneously and 5 per cent. intravenously died, and eight lived. In all these cases, treatment with the salt mixture was begun after a fall in the chlorids with beginning evidence of toxemia, and always before the lateral anastomosis. Two of the five treated with 10 per cent. sodium chlorid solution intravenously and lateral anastomosis lived. One died during the injection, one was moribund when treatment was begun, and one died the day following anastomosis from unknown cause. One of the three dogs treated with 25 per cent. salt solution intravenously and lateral anastomosis lived, one died during the injection, and the third died before anastomosis was done.

We have observed a patient with pyloric obstruction [17] due to carcinoma with a urea nitrogen of 56 and chlorids of 320. This patient lived with a rapid return of blood chemistry to normal after gastroenterostomy and administration of sodium chlorid. Another patient with obstruction of the small intestine had the blood chlorids reduced to 300 and a urea nitrogen of 31. This patient recovered without operation after treatment with large doses of sodium chlorid. The urine in this case, during the height of the toxemia, showed a very high percentage of nonprotein nitrogen and just a trace of chlorids. These rapidly returned to normal with the chlorid treatment.

We have recently studied a case of congenital pyloric stenosis with a blood urea nitrogen of 50, chlorids of 290, and carbon dioxid combining power of the plasma of 73. This case will be reported in detail later.

Dixon [18] has treated five cases of duodenal obstruction with sodium chlorid, with excellent results. Recently, McVicar [19] studied the blood chemistry of thirty cases of high intestinal tract obstruction. He emphasized the value of treatment in such cases with sodium chlorid, glucose and water.

COMMENT AND CONCLUSIONS

These results all lead to the conclusion that sodium chlorid has some protective value against the toxemia developed in high intestinal tract obstruction. Distilled water does not prolong life or return the blood chemistry to normal as does sodium chlorid.

The sodium chlorid seems to be the essential factor in the treatment of the toxemia, and its estimation in the blood serves as an indicator of the degree of toxemia. It appears from experiments that there is always, to some extent, a depletion of the chlorids before protein destruction begins with a rise in the nonprotein elements of the blood. Just what the danger point is in the fall of the chlorids, we have not definitely determined. It probably varies in different individuals. We feel that a blood chlorid of 400 in intestinal obstruction should be a signal for the generous administration of sodium chlorid. Judging from our experimental studies and observations of patients, it is essential to administer sodium chlorid in acute intestinal obstruction before operation as well as after. The quantity of the salt necessary to return the blood chemical changes to normal can be determined only by blood studies. A diminution in chlorids is easily determined by their precipitation in the urine with silver nitrate solution and comparing with the normal. We have made a rough estimate that 1 gm. of sodium chlorid per kilogram of body weight should be given as an initial dose in very toxic patients. This is best given subcutaneously in 1 or 2 per cent. solution or intravenously in 5 per cent. solution.

Too few clinical observations have been made to form the basis of any conclusions concerning mortality rates. However, we feel confident that surgical risks may be lessened by the preoperative use of plenty of salt, and lives saved by its careful administration until the toxemia of intestinal obstruction has disappeared.

This paper, together with the papers of Drs. Thalhimer and Jones, McKittrick and Root, which precede it, and the papers by Drs. Mayo and Walters, and Clark and Lahey, to appear next week, are part of a symposium on the "Poor Surgical Risk." The discussion will follow the papers to be published in our next issue.

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Thyroid and Pancreas Only Effective Organ Extracts.—If we are called upon to enumerate the cases in which it is possible to employ a true substitution therapy—artificially to replace the internal secretion of a gland—we have as yet only two clear instances, those of the thyroid and the pancreas, and of these only one, the thyroid, is known to produce any effect when given by the mouth.—Vincent, Swale: *Proc. Royal Soc. Med.* **18**:33 (June) 1925.

DOES ROENTGEN RAY MODIFY THE COURSE OF WHOOPING COUGH?*

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In a previous communication, one of us [1] expressed the opinion, based on a small series of cases, that the roentgen-ray treatment of whooping cough, as advocated by Bowditch and Leonard,[2] held promise of value. Subsequent reports by these investigators [3] and by others have appeared, extolling the method. Since the results, while distinctly promising, have not appeared conclusive, it seemed desirable to us to attempt a study that would permit more definite judgment.

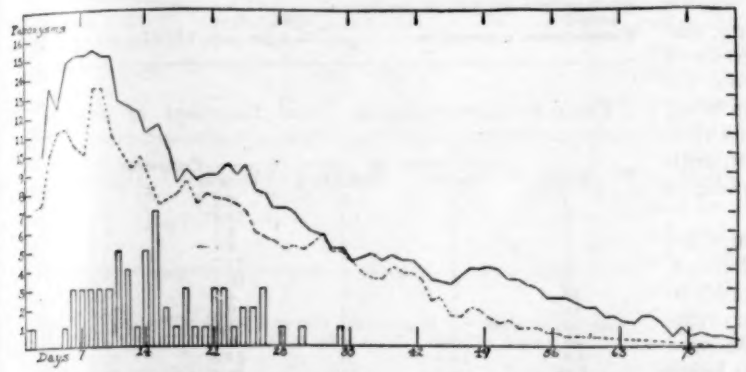

Chart 1.—Average daily number of paroxysms, by days: The "days" or "weeks" in this chart and the other ones refer to the paroxysmal period from its beginning. The columns show the number of roentgen-ray treatments on a given day, plotted on the same ordinate scale as the paroxysms. This curve has been plotted by days, instead of by weeks as in Table 5, to show greater detail. The marked parallelism of the two lines may be noted. Solid line, roentgen-ray cases; broken line, controls; columns, roentgen-ray treatments.

The difficulty of justly appraising the value of whooping cough therapy is apparent when one reviews the almost uniformly "good results" that have been reported from an amazing number of highly diverse drugs and procedures. During the last five years alone, reports have been published of successful treatment with hemotherapy, pertussis vaccine, pertussis serum, serobacterin, smallpox vaccine, protein, lactic acid bacilli, ether, quinin, alum, silver nitrate, magnesium sulphate, benzyl benzoate, phenobarbital (luminal) and various other drugs, and gastric lavage, ultraviolet light, diathermy and the roentgen ray.[4] In many of the reports a control group is mentioned, though practically always smaller than the test group. Close study of the reports frequently shows that patients have been taken at all stages of the disease and in large proportion in the third, fourth, fifth or later week; that improvement, while frequently "rapid," has rarely been abrupt and that the control group is rarely, if ever, really comparable to the treated group. Various difficulties have stood in the way of obtaining suitable controls such, for instance, as that illustrated by the following quotation from Luttinger's [5] paper on pertussis vaccine which, based on an unusually large number of cases, seemed to show a definite advantage for the vaccine:

> The number of curative cases tabulated amount to 1,101, of which 952 were treated with pertussis vaccine (three or more injections) and the rest (149) with drugs. We had planned at the outset to have an equal number of cases in each class; but we found it difficult to carry out this plan in practice. In the early days of the clinic we had an overwhelming number of drug cases because parents did not trust the "needle" treatment. Later on, with the increasing popularity of the vaccine treatment, it became difficult to secure an adequate number of control cases.

Since the variability in severity of whooping cough is great not only in individual cases and between epidemics but also between different periods of the same epidemic, Luttinger's figures as well as similar ones from other studies lose most of their value, since control and test cases are not necessarily comparable.

The only statement we have found about controls in the several reports of Bowditch and Leonard is as follows: "In addition to the 400 cases treated with the roentgen ray we also followed and tabulated for comparison 200 cases which were not so treated." No further details are given.

In studying the problem of whooping cough therapy, it is absolutely essential to have adequate controls in order that due account may be taken of the variables in a highly variable disease. The control patients should not only be in approximately equal numbers with the test patients, but they should be chosen from the same epidemic and from the same period of the epidemic, and moreover should be of approximately the same ages. The best method of selection is obviously to take alternate patients for each group.

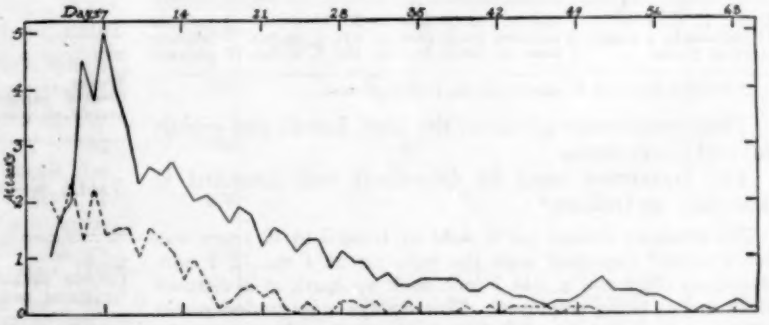

Chart 2.—Average daily number of vomiting attacks, by days: This curve has been plotted by days, instead of by weeks as in Table 6, to show greater detail.

In the present paper we report the results of a study based on equal numbers of control and test cases selected in such a manner as to afford if possible a just comparison between those treated and those not treated with the roentgen ray. Forty-four consecutive patients from the Stanford Children's Clinic, in the paroxysmal stage of pertussis, formed the material for the study.

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* From the division of pediatrics, Stanford University Medical School.

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Twenty-two of these were given treatment by roentgen ray, and the remaining twenty-two were treated with antipyrin. With five exceptions, the division of patients into the two groups was made by alternation. Of the five exceptions, two patients were suffering from a rather severe form of the disease; their inclusion has raised the average number of paroxysms and perhaps the average duration of the disease in the irradiated group. We regret this fact, but do not feel that it or other minor differences between the two groups affect such deductions as we have to draw from our data.

It would no doubt have been better for statistical purposes not to treat the control group at all or merely by placebo. This we did not feel justified in doing, and all of the control patients were given moderate doses of antipyrin. The irradiated patients were also given the same drug when it was evident that no effect was being obtained from the roentgen ray. The two groups then afford a comparison between children treated with antipyrin and children treated with roentgen ray, plus, in some cases, the same drug.

The diagnosis was made on characteristic symptoms and in most instances was corroborated by blood count. Cultures were not taken. Mothers were required to make daily notation of the number of paroxysms ("paroxysm" being defined as a coughing spell followed by a definite whoop) and of vomiting attacks; to bring their reports once a week to the clinic, and after the whoop had disappeared to continue the records until dismissed. Delinquents were followed up by one of us personally (H. P. S.). The records are with few exceptions satisfactorily complete. They date from Nov. 8, 1924, to May 7, 1925.

Roentgen-ray treatment was given uniformly according to the following specifications: 8 milliamperes, 9 inch parallel spark, 0.25 mm. copper and 1 mm. aluminum filters, 12 inch anode-skin distance, to 6 inch circular areas front and back of chest. The length of exposure was graduated by the schedule in Table 1.

TABLE 1.—*Schedule for Roentgen-Ray Treatments*

Under 15 months:	1 minute (each dose = 56 E* units)	3 patients
15 months to 2 years:	2 minutes (each dose = 112 E units)	2 patients
Over 2 years:	3 minutes (each dose = 168 E units)	17 patients

* Twelve hundred E constitute an erythema dose.

Treatments were given on the first, fourth and eighth days of observation.

The treatment used by Bowditch and Leonard is described as follows [6]:

> The ordinary dosage for a child of from 5 to 10 years was five minutes' exposure with the tube set at 4 ma., a 1 mm. aluminum filter and a 6 to 7 inch back up spark at a distance of 28 inches being employed. This dosage was graded somewhat, so that an infant of 3 or 4 months would receive the same dosage, with the exception that the time interval would be three instead of five minutes. The first treatment was given over the anterior chest, the second treatment over the back of the chest, and the remaining treatments alternating in this manner. The total dosage was well within the limits of safety, four exposures totaling less than one half an erythema dose. . . . Patients were given treatments every alternate day for three treatments—the first, third and fifth days. Then, after an interval of seven days, a similar second course of treatments was given in the more protracted and resistant cases. These additional treatments were infrequent, not seeming necessary, as a rule. . . . Very few of the patients had more than four treatments.

Our single and total dosages appear to have been considerably larger than those of Bowditch and Leonard.

6. Bowditch (Footnote 3, second reference).

The results of our comparative study of the two groups are given in the tables and graphs.

TABLE 2.—*Summary*

	Control Series	Irradiated Series
Number of cases	22	22
Average age	3.3 years	2.9 years
Average length of prodromal period	10.1 days	11.5 days
Average duration of paroxysmal period before admission to clinic	6.8 days	9.4 days
Average duration of symptoms before admission	16.9 days	20.9 days
Average total duration of disease to end of paroxysms	54.5 days	62.5 days
Average total duration of paroxysmal period	44.3 days	51.2 days
Complications occurred in	13.6 per cent. (3)	13.6 per cent. (3)

TABLE 3.—*Distribution of Total Durations of Disease*

Weeks	Number of Cases		Percentage	
	Control	Irradiated	Control	Irradiated
4	2	0	9.1	0
5	3	2	13.6	9.1
6	2	1	9.1	4.5
7	2	3	9.1	13.6
8	5	5	22.7	22.7
9	4	3	18.2	13.6
10	1	1	4.5	4.5
11	2	3	9.1	13.6
12	1	3	4.5	13.6
16	0	1	0	4.5
4-8	14	11	63.6	50.0
9-16	8	11	36.4	50.0

TABLE 4.—*Distribution of Durations of Paroxysmal Period*

Weeks	Number of Cases		Percentage	
	Controls	Irradiated	Controls	Irradiated
2	1	0	4.5	0
3	2	1	9.1	4.5
4	2	3	9.1	13.6
5	2	0	9.1	0
6	5	4	22.7	18.2
7	3	5	13.6	22.7
8	4	1	18.2	4.5
9	2	3	9.1	13.6
10	1	4	4.5	18.2
14	0	1	0	4.5
2-6	12	8	54.5	36.4
7-14	10	14	45.5	63.6

TABLE 5.—*Average Number* of Paroxysms Daily, by Weeks*

Weeks	1	2	3	4	5	6	7	8	9	10
Control patients	10.2	10.9	7.9	6.4	5.1	3.7	1.9	0.9	0.1	0.02
Irradiated patients	14.3	12.6	9.6	8.3	5.8	4.5	3.7	3.2	1.8	1.1

TABLE 6.—*Average Number* of Vomiting Attacks Daily, by Weeks*

Weeks	1	2	3	4	5	6	7	8	9
Control patients	1.7	1.2	0.4	0.1	0.1	0.04	0.1	0.04	0
Irradiated patients	3.3	2.7	1.8	1.2	0.7	0.5	0.2	0.4	0.1

* The figures in these tables were obtained by dividing the total number of reported attacks by the total number of reported days. The averages are therefore for the entire group exclusive of those cases in which exact data were unavailable (chiefly during the period preceding admission to the clinic).

TABLE 7.—*Percentage* of Patients Still Whooping at Any Given Week After the Onset*

Weeks	1	2	3	4	5	6	7	8	9	10
Control patients	100	100	94.7	95.0	76.5	65.0	52.3	31.8	9.1	4.5
Irradiated patients	100	100	100	100	90.0	77.8	63.2	42.8	36.3	22.7

* Percentages calculated by dividing number of patients whooping by total number of patients having exact reports during given week.

It is evident that in our two series, the patients who did not receive roentgen-ray treatment made a better showing in practically all respects.

The total average duration of the disease and the average duration of the paroxysmal stage were considerably less; the daily average of paroxysms and of vomiting attacks was lower throughout the course of the disease; the proportion of patients who stopped whooping and vomiting early was greater, and but one was still whooping (last three paroxysms) in the tenth week as compared with five of the irradiated patients. Such differences were, it is probable, determined by a greater average initial severity of disease in the treated

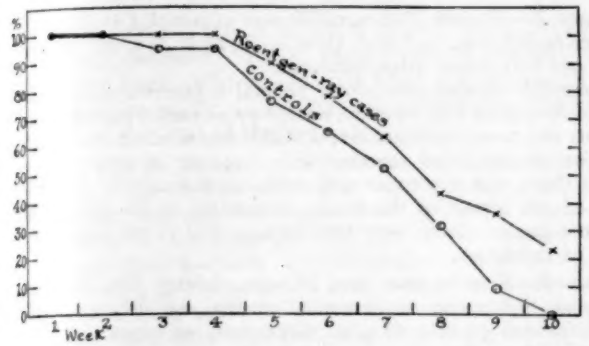

Chart 3.—Percentage of patients still whooping at any given week after onset; one of the irradiated patients whooped for fourteen weeks.

group (affording a somewhat more rigorous test of the virtues of irradiation), but they certainly give no hint of benefit from the roentgen ray. Particularly illuminating are the comparative curves of the average daily number of paroxysms in the two groups. In both there is an abrupt rise during the first week and the first part of the second, then an even more abrupt drop during the latter part of the second week and the first part of the third, followed by a gradual and fairly even decline during the remaining weeks. It is notable that the two curves are quite uniformly parallel during the first four weeks and that the largest number of roentgen-ray treatments were given during the period of most rapid decline, which had, however, already begun before many treatments had been given and which was no more rapid in the treated than in the control series. Had we had no controls or had the controls been taken from another epidemic with a different average course it would have been hard to resist the temptation to assume a definite and marked beneficial effect from irradiation. It will be noted that in the fifth week the two curves for a brief period almost coincide. Here, if anywhere, the irradiated group appears to have progressed more favorably than the control. Since, however, the advantage appears to be due to a temporary (perhaps accidental) increase in paroxysms in the control group rather than to coincident decline in the irradiated group, since it occurs at least two weeks after any considerable number of roentgen-ray treatments had been given, and is followed soon by an increasing divergence in favor of the controls, one may fairly conclude that no real effect of irradiation is in evidence.

We have already given one reason why the observer of uncontrolled cases may be misled into thinking that he has obtained successful results in treatment with the roentgen ray—or with some other method that he has used. Another reason is the enthusiasm with which mothers and even physicians are apt to greet new remedies, particularly in the case of whooping cough. Luttinger's experience with vaccine has already been cited.

We have kept record of some statements made to us during the course of the present study. Two mothers thought the paroxysms more severe on the day of treatment and less severe afterward, but their children continued to whoop until the fifth and ninth weeks, respectively. The record kept by one mother, who said she was "pleased" with the treatment and that her child whooped less frequently and severely after it, showed that her child whooped for six weeks. Another thought the treatment "wonderful," but her child whooped for seven weeks. Another child, whose mother was very pessimistic about the treatment, also whooped for seven weeks. It is also of interest that five patients—those mentioned in an earlier paragraph—were sent out of turn for roentgen-ray treatment by clinic physicians who had become enthusiastic about it and thought that the children should not be denied its benefits. In the irradiated group in two instances the paroxysms rapidly decreased after admission, ceasing entirely during the fifth and sixth weeks, but these are matched by seven similar cases in the control group. One patient (not included in the present series) whooped but four days and another (fortunately in the control group) stopped whooping rather suddenly in the second week. We cite these instances to illustrate the great care needed correctly to interpret clinical findings in whooping cough.

We believe that our figures afford strong evidence against the assumption that the roentgen ray has a curative or even beneficial physical effect in the treatment of whooping cough. This result of our study was unexpected by us, since we began the investigation with a prepossession in favor of the treatment based on previous clinical impressions. We cannot deny that occasionally sudden, if temporary, remissions in whooping may occur after irradiation, as apparently after other kinds of treatment. The fact that such remissions have been reported from so many different methods may be accounted for largely by the sudden

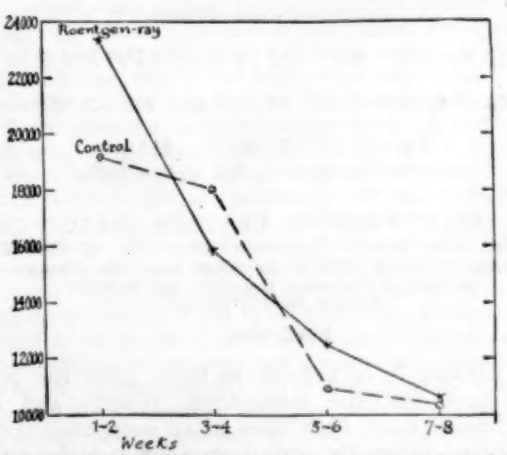

Chart 4.—Average total leukocyte count, by two week periods; the greater drop in the count in the irradiated patients during the first four weeks may have been due to the roentgen ray, but the number of counts was not large enough to make this inference conclusive.

and frequently unexpected fluctuations in the normal course of the disease and partly (as is well recognized) by the psychic reaction made by a strange or startling procedure on a young and highly impressionable child. The roentgen-ray treatment is well adapted to produce such a reaction. The patient is laid and held on a table, usually much against his will, while strange lights and sparks and noises play about him. Indeed, it has been reported to us that the mere taking of a roentgenogram has caused a striking, though temporary, diminution in attacks.

SUMMARY

In two parallel series of twenty-two cases of whooping cough, selected mainly by alternation, one group treated by roentgen ray and the other by antipyrin, the disease ran an average longer course, fewer patients ceased whooping in the early weeks and more patients were still whooping in the late weeks in the irradiated series than in the controls. The present study would appear to justify the conclusion that radiotherapy is without true beneficial effect in pertussis. Our method of treatment does not appear to differ in essentials from that ordinarily used. It is possible, and perhaps likely, that occasional temporary exacerbations or inhibitions of attacks may occur shortly after roentgen-ray treatment, but these should probably be ascribed to psychic disturbance. Effects of greater extent or duration, such as have been previously reported from roentgen-ray as from other modes of treatment (excepting sedative drugs), are in all probability apparent rather than real and represent normal fluctuations in the course of a highly variable disease.

SUBSEQUENT NOTE

After the completion of our manuscript, there appeared another paper by the Boston investigators.[7] The claim made in this paper that the "roentgen-ray treatment of whooping cough seems to have passed beyond the experimental stage" is still unsupported by control data, or even by a detailed analysis of the results of treatment (duration of paroxysmal period, average number of attacks daily, and so on) such as would permit a comparison with other series of cases treated differently. The absence of controls in this, as in the earlier reports, is particularly unfortunate, obscuring as it does the significance of the low mortality noted, since variations in the severity of epidemics from year to year have to be taken into account.

POISONING BY TETRA-ETHYL LEAD

POSTMORTEM AND CHEMICAL FINDINGS *

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Our purpose is to present in brief form the postmortem protocols, the microscopic reports and the chemical analyses of four cases of an occupational disease acquired during the manufacture of so-called tetra-ethyl lead. It is not our intention to discuss the dangers involved in the manufacture of tetra-ethyl lead or the dangers of the liquid used as an antiknock agent, the ethyl gasoline. We have made no experiments concerning the toxicity of the substance itself or of the ethyl gasoline.

A paper dealing with the clinical histories of the four cases presented here is in preparation by Dr. Gilman Thompson and his associates in the Reconstruction Hospital of New York; we are indebted to them for the privilege of studying the clinical histories.

7. Smith, L. W.; Bowditch, H. I.; Leonard, R. D.; Emerson, P. W.; Wyman, E. T.; Barron, E. W.; Green, Hyman; Hubbard, Elliott; and Tennis, Max: Treatment of Pertussis by Roentgen Ray: An Analysis of Eight Hundred and Fifty Cases, J. A. M. A. 85: 171 (July 18) 1925.

* From the pathologic laboratories of Bellevue and Allied Hospitals and the toxicologic laboratory of the Chief Medical Examiner, City of New York.

POSTMORTEM PROTOCOLS

CASE 1.—A white man, aged 31, was admitted to the Reconstruction Hospital, Oct. 25, 1924, with the symptoms of visual and auditory hallucinations and delirium. Death occurred, October 26, at 3:30 p. m., twenty-one hours after admission.

A postmortem examination revealed a distinct, peculiar yellowish discoloration of the skin of the face, intense hemorrhagic bronchopneumonia, congestion of the lungs and brain and hyperemic foci in the bone-marrow of the femur.

CASE 2.—A white man, aged 25, was admitted, Oct. 27, 1924, in active delirium, and died, October 28, at 1:30 a. m., thirteen and one-half hours after admission.

Necropsy showed generalized visceral congestion with slight parenchymatous degeneration, intense pulmonary congestion and edema and bronchopneumonia; a slight degree of chronic leptomeningitis was noted, together with moderate cerebral congestion; there was a peculiar yellowish discoloration of the skin and of the cortex of the brain, resembling, in the latter, old plaques jaunes; there were hemorrhagic foci in the bone-marrow of the femur.

CASE 3.—A white man, aged 29, was admitted, Oct. 25, 1924, with the symptoms of insomnia, anemia and delirium. He died, October 29, at 4:40 a. m., three days, ten hours and forty minutes after admission.

At necropsy, the skin was extraordinarily pale, that of the face having a yellowish tint; the lips were pale; examination of the body showed hemorrhagic bronchopneumonia, thick blood and desiccation of the tissues, and hemorrhagic foci in the bone-marrow.

CASE 4.—A white man was admitted, Oct. 25, 1924, with the symptoms of delirium, disorientation, and visual and auditory hallucinations. Death occurred, October 30, five days after admission.

A postmortem examination revealed yellow discoloration of the face, slight visceral congestion, slight syphilitic aortitis, pulmonary engorgement, and focal hyperemia of the bone-marrow of the femur.

GENERAL SUMMARY OF NECROPSIES

In three cases hemorrhagic bronchopneumonia and intense pulmonary engorgement were present, the appearance of the lungs very closely resembling that encountered in malignant influenza. In one case the tissues were markedly desiccated, and in another yellowish discoloration of the cerebral cortex and chronic leptomeningitis were observed. All the cases showed yellowish discoloration of the skin and hemorrhagic foci in the bone-marrow.

MICROSCOPIC EXAMINATION

The tissues were preserved in 10 per cent. dilution of solution of formaldehyd, and the sections were stained with hematoxylin and eosin. The microscopic findings were strikingly similar.

The lungs of three of the patients showed a most intense vascular engorgement, in Cases 1 and 2 frank hemorrhages. There was no evidence of bronchopneumonia. The bronchi were singularly free from exudate, except for the presence of red blood cells in the smaller bronchi. There was also intense congestion of the spleen and kidneys, especially marked in Cases 1 and 2. There was fairly abundant glandular tissue in the thymus of all four cases. In Case 4, the aorta presented a syphilitic inflammation. In none of the cases was there any disease of the kidneys or of the liver. The liver in every case was peculiar in that the general engorgement found in the other viscera was absent. In all the cases, the brain showed marked injection of the finer vessels and engorgement of the larger vessels. Many of the smaller vessels of the brain showed a picture resembling strikingly the agglutinative thrombi of red blood cells and, about the thrombi, was a considerable amount of material, strongly eosinophilic. The ganglion cells in all the cases showed little change in the sections stained by hematoxylin and eosin. (Other methods of staining were not used.) The thrombi described were not seen in the vessels of the other organs and, thus, may be of significance. In Case 4, the red

cell thrombi were not as numerous or as marked as in the other cases. The testes showed no changes from the normal; spermatogenesis was active. In Case 2, however, there were areas in which the walls of the tubules were hyaline and thickened. The interstitial cells were not abundant.

SUMMARY

The striking microscopic features were the intense engorgement with frank hemorrhage of the lungs in Cases 1 and 2, general visceral congestion, except for the liver, and congestion of the vessels of the brain with red blood cell thrombi.

CHEMICAL ANALYSIS

The object of the analytic work devoted to these cases was twofold: First, to determine whether the tetra-ethyl lead could be isolated from the organs after death and, secondly, to estimate quantitatively the total amount of the lead in the various organs.

Isolation of the Volatile Lead Compound.—About 250 gm. of brain tissue was distilled with steam, until 500 c.c. of distillate was obtained; the distillate was collected in a flask, which was immersed in an ice bath, and 450 c.c. of the distillate was divided into three portions. To one portion was added a little sulphuric acid; to the second, a little sodium bicarbonate, and to the third, some oxalic acid. All three were boiled under a reflux for eight hours and then evaporated to 25 c.c. To the sulphuric acid hydrolized portion, an equal volume of 95 per cent. alcohol was added. All three portions were allowed to stand overnight. The next day, each of the three solutions presented a very small insoluble sediment, best seen on rotary motion of the liquid in the beaker. The three sediments were collected by centrifugalizing and were examined under the microscope. The first showed small needle-like crystals, typical of lead sulphate. Examination of the second disclosed an amorphous sediment, with a few needle-shaped crystals of lead carbonate. The third presented right-angled slender crystals, typical of lead oxalate. Each of the three sets of crystals conformed with the crystals obtained from a very dilute lead acetate solution, treated in exactly the same manner as that described above.

To prove further that lead was present in the distillate, the sediment obtained in the sulphuric acid hydrolysis was treated with 2 drops of ammonium acetate and warmed; it dissolved readily. A drop of this solution was placed on a microscopic slide, to which were added a drop of copper acetate solution, 2 drops of saturated potassium nitrite and 1 drop of a 10 per cent. solution of acetic acid; a cover glass was placed thereon, and it was then allowed to stand. Examination under the microscope revealed small black cubes, typical potassium lead copper triple nitrite crystals.

These experiments proved that a volatile lead compound was isolated from the brain tissue.

Quantitative Determination of the Volatile Lead Compound (Colorimetrically).—From the icebox, 250 gm. of brain substance was removed, finely ground while ice cold, and placed in a distilling flask, together with an equal amount of water, and distilled with steam, an extra long condenser being used. By means of an adapter, the distillate was allowed to run directly into a 1 liter Erlenmeyer flask containing about 25 gm. of cracked ice, until 800 c.c. was collected. Twenty-five c.c. of concentrated hydrochloric acid was added to this distillate. The distillate was boiled under a reflux condenser for eight hours, and allowed to stand until the next day. This procedure converted the volatile lead compound to lead chlorid. The solution was placed in a casserole and evaporated on a water bath to a volume of from 2 to 3 c.c., after which it was quantitatively transferred to a 50 c.c. Erlenmeyer flask by means of distilled water, and the final volume brought to about 25 c.c. This method served to concentrate the 800 c.c. of hydrolyzed distillate to 25 c.c. and to bring the acidity down to about 2 per cent. of hydrochloric acid. Washed hydrogen sulphid was then passed into the solution for one-half hour, after which the flask was stoppered and allowed to stand. The next day a small amount of a black precipitate was present. This precipitate was filtered through a small filter paper and washed with hot distilled water. It was then dissolved by a small amount of hot double-normal nitric acid. This solution was boiled to drive out all the hydrogen sulphid. The lead was determined by the colorimetic-micromethod, as suggested by Fairhall,[1] namely:

The solution of lead nitrate was neutralized by sodium hydroxid and acidified with acetic acid. Excess of potassium chromate was added, and the solution was boiled and allowed to stand over night. The next day it was filtered through a very small filter paper and thoroughly washed with warm water. The precipitate was then transferred from the filter paper to a 25 c.c. volumetric flask. The small amount of lead chromate in the pores of the filter paper was dissolved by (1-1) hydrochloric acid, quickly followed by hot water, and this was added to the main portion of the lead chromate in the volumetric flask. To this solution containing the liberated chromic acid was then added 1 c.c. of a solution of S-diphenyl carbazid in glacial acetic acid, and the whole was diluted to the 25 c.c. mark. The red thus developed was compared in the colorimeter with a standard chromic acid solution similarly treated with the carbazid.

Quantitative Determination of the Nonvolatile Lead.—The gravimetric method was used in the major part of the work, because the amount of lead present in the tissues, as indicated by preliminary tests, was too large to be determined colorimetrically.

The tissues were finely ground and evaporated to dryness on a steam bath. The dry residue was ashed in an electric muffle, below full red heat. Instead of trying to obtain a white ash during the first ignition, it was deemed preferable to extract the charred mass with hot dilute hydrochloric acid, reignite the residue, again extract, and so on, repeating this operation four times, after which a small amount of grayish residue was left. This residue might still contain some insoluble lead phosphate; therefore, this insoluble material was finally extracted with tartaric acid solution containing a little hydrochloric acid. The combined extracts, containing all the lead, were evaporated to about 30 c.c., and the solution was neutralized with sodium hydroxid solution, methyl orange being used as an indicator. Enough hydrochloric acid was then added to obtain a distinct acid reaction, and washed hydrogen sulphid was then passed through the solution for a half-hour, after which the flask was stoppered and allowed to stand over night. A black precipitate of lead sulphid resulted. This was filtered off and thoroughly washed with hot distilled water. The precipitate was dissolved in the least possible amount of hot double-normal nitric acid. The solution so obtained was boiled to expel the last traces of hydrogen sulphid. After the solution had cooled, 1c.c. of sulphuric acid was added. It was then evaporated and finally heated until fumes of sulphur trioxid were evolved. This converted all the lead into lead sulphate. Then 20 c.c. of water was added and the mixture kept on the steam bath for one hour. When the temperature had dropped below 70 C., twice the volume of 95 per cent. alcohol was added, and it was allowed to stand over night. The white crystalline precipitate of lead sulphate so obtained was quantitatively filtered through a weighed Gooche crucible. The lead sulphate was washed with 4 per cent. sulphuric acid, then with 80 per cent. alcohol and finally with 95 per cent. alcohol. It was dried at 100 C. and finally ignited to redness. It was then weighed as lead sulphate. The solubility of lead sulphate in alcohol-water is 0.3 mg. in 60 c.c. This amount was added to the final weight of lead sulphate.

The results of the analyses are given in the accompanying tables.

In Case 1, the volatile lead compound isolated from 250 gm. of brain tissue was 0.85 mg. calculated as lead. This, calculated on the entire brain, amounts to 4.25 mg. No volatile lead compound could be isolated from the other tissues.

In Case 2, the volatile lead compound isolated from 250 gm. of brain tissue was 0.71 gm. calculated as lead.

1. Fairhall, L. T.: J. Indust. Hyg. 4:9 (May) 1920.

This, calculated on the entire brain, amounts to 4.77 mg. No volatile lead compound could be isolated from the other tissues.

TABLE 1.—*Chemical Analysis in Case 1; Body Weight, 48.2 Kg.*

	Total Weight of Organ, Gm.	Weight of Tissue Used, Gm.	Lead Sulphate Found, Mg.	Lead Found, Mg.	Total Lead in Organ, Mg.
Brain	1,250*	250	7.0	4.78	23.90
Bone (Vert.)	8,840*	285	1.88	1.284	39.83
Blood	3,070*	30	.....	0.027†	2.76
Lungs	1,540	250	1.6	1.09	6.71
Liver	1,400	250	12.5	8.54	47.82
Kidney	340	120	1.8	1.23	3.48

* Estimated weight of entire organ.
† Microcolorimetric method used.

TABLE 2.—*Chemical Analysis in Case 2; Body Weight, 54.5 Kg.*

	Total Weight of Organ, Gm.	Weight of Tissue Used, Gm.	Lead Sulphate Found, Mg.	Lead Found, Mg.	Total Lead in Organ, Mg.
Brain	1,680	250	6.14	4.194	28.18
Lungs	1,580	250	0.77	0.526	3.32
Liver	1,880	250	11.97	8.175	61.47
Kidney	380	110	4.52	3.087	10.66
Blood	3,400*	28	.....	0.027†	3.28
Bone (femur)	9,730*	230	1.67	1.139	48.19

* Estimated weight of entire organ.
† Microcolorimetric method used.

TABLE 3.—*Chemical Analysis in Case 3; Body Weight, 52.3 Kg.*

	Total Weight of Organ, Gm.	Weight of Tissue Used, Gm.	Lead Sulphate Found, Mg.	Lead Found, Mg.	Total Lead in Organ, Mg.
Brain	1,250*	250	5.66	3.86	19.40
Lungs	900	250	2.306	1.575	5.67
Liver	1,500	250	7.450	5.088	30.53
Kidney	295	120	2.928	2.00	4.92
Bone (Vert.)	9,200*	185	1.133	0.774	38.49

* Estimated weight of entire organ.

TABLE 4.—*Chemical Analysis in Case 4; Body Weight, 61 Kg.*

	Total Weight of Organ, Gm.	Weight of Tissue Used, Gm.	Lead Sulphate Found, Mg.	Lead Found, Mg.	Total Lead in Organ, Mg.
Brain	1,250*	250	4.64	3.17	15.84
Lungs	900	250	0.887	0.606	2.25
Liver	2,130	250	9.953	6.798	57.92
Kidney	400	125	2.344	1.600	5.12
Bone (Vert.)	10,800*	200	1.388	0.948	51.21

* Estimated weight of entire organ.

No volatile lead compound could be isolated in Case 3.
No volatile lead compound could be isolated in Case 4.

It is of interest to note that, in the general analytic procedure for other toxic substances, it was found that the organs in each of the four cases also contained a small amount of mercury. The liver and the kidney contained more mercury than the other tissues. The amount of mercury in the four sets of kidneys ranged between 0.85 and 1.25 mg. to each 100 gm. of kidney tissue.

SUMMARY OF CHEMICAL FINDINGS

1. A volatile lead compound was isolated and proved in the brain tissue in two of the four cases. The amount of this compound that remained in the two brains up to the time of the analysis was 4.25 mg. and 4.77 mg. The rest of the lead in these brains was in a nonvolatile form. The fluids of the tissues had hydrolyzed most of the tetra-ethyl lead into a nonvolatile lead salt. In the two cases in which no such compound could be isolated, the patients lived twenty-seven and forty-nine hours, respectively, longer after exposure to the tetra-ethyl lead. This additional time interval evidently hydrolyzed all the tetra-ethyl lead into a nonvolatile form. No volatile lead compound could be isolated from any other tissues.

2. The total amounts of lead found in the various tissues analyzed are given in the tables.

3. Contrary to the usual findings in lead poisoning, the bones in these cases did not show a very high lead content as compared to that found in the other tissues. Calculated on equal portions of tissue, the brain and liver exceeded the bones in the lead content.

4. The brain tissue in these cases contained much more lead than is usually found in cases of lead poisoning. This can be explained, perhaps, by a specific attraction of brain tissue for tetra-ethyl lead.

5. The lungs also showed a somewhat high quantity of lead, indicating absorption through them.

6. The liver and kidneys contained a very large amount of lead, indicating a process of attempted removal from the body.

7. All the organs, including the blood, contained lead. This points to a very recent intake of lead in some form.

8. A small amount of mercury was found in the liver and in the kidneys in all four cases.

Municipal Building.

GLYCOGENOLYTIC ACTION OF INSULIN *

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Since the discovery of insulin by Banting and Best, the problem of the mechanism of insulin action has played an important rôle in practice and research. If we knew how insulin acted when introduced into the mammalian body and what organs participated in the increased sugar metabolism, the knowledge would aid the physician to adapt insulin therapy to the individual diabetic patient and to determine insulin dosage in the particular stage of the disease.

THE TWOFOLD ACTION OF INSULIN

From work initiated by one of us in connection with others,[1] a twofold action of insulin has been developed when it was observed that a nerve action played a part in insulin effect. This work was based on studies of differences in insulin effect when different modes of administration were used in animals.

On administering like dosages of insulin (0.5 unit per kilogram of body weight) subcutaneously, intravenously and intradermally, it was found that during a period of about two hours following the injection no very distinct differences could be observed in the blood sugar curves; after this period the intradermally injected insulin exceeds the others in duration and intensity of effect. Similar results obtained in human beings, both in normal controls and in diabetic patients, have been discussed in another paper.[2]

* From the Department of Preventive Medicine, University of Illinois College of Medicine.

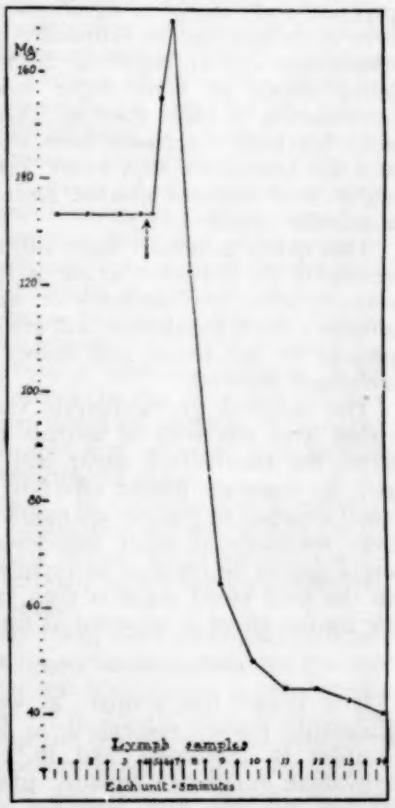
1. Müller, E. F., and Corbitt, H. B.: J. Lab. & Clin. Med. 9:612 (June) 1924.

2. Müller, E. F.; Wiener, H. E., and Wiener, R. von E.: Proc. New York Soc. Biol. & Med., April, 1925; München. med. Wchnschr. 72: 1061, 1925.

From these findings, the conclusion has been reached that insulin acts differently, depending on whether or not it acts from a tissue depot such as an intradermal deposit, or after absorption into the circulation.

From a tissue deposit, insulin acts on the glycogenetic function of the liver merely by nerve stimulation. This nerve action and the glycogenetic reaction and the consequent lowering of the blood sugar are effective as long as insulin remains unabsorbed in its tissue depot.

The nerve action is conducted parasympathetically; it is particularly intensive from an organ such as the skin. It is almost negligible after subcutaneous injection, and entirely lacking after intravenous injection. The nerve action and the glycogenic liver reaction do not depend on the dosage. With the onset of resorption of the insulin deposit, the hormone enters the circulation, establishes the necessary contact with the respective organs, and becomes effective in the tissue after a certain period of time. The sugar is metabolized by processes not known in all phases and details, but the process is independent of liver function and is in its effectiveness directly proportional to the quantity of insulin present in the circulation.



Effect of a subcutaneous injection of insulin on the lymph sugar; the arrow indicates subcutaneous injection of 20 units of insulin.

A dual effect is thus produced, a glycogenesis, the result of a nerve stimulus, and a glycolysis, the result of a hormone action. The nerve effect is active before absorption, while the hormone action is not effective until insulin has entered the circulation. The nerve effect initiates a physiologic liver action, glycogenesis. The hormone action, on the other hand, is a purely biologic result of the interaction of insulin and tissue extractives, and obtainable in vitro.

HYPERGLYCEMIA FOLLOWING SUBCUTANEOUS INJECTION OF INSULIN

In recent experiments, we have sought to determine whether or not differences exist in blood sugar curves during the period immediately following intradermal and subcutaneous insulin injections.

Our experiments have been made exclusively on dogs of from 8 to 13 kg. Insulin-Lilly was used in different quantities and the blood sugar determinations were carried out at ten minute intervals before, and after the injections, for a period of one hour or longer. Such experiments were controlled by a number of simultaneous lymph sugar determinations.

The following protocols, and the chart of the effect on the lymph determination, indicate the striking differences that follow the different routes of administration:

INTRACUTANEOUS INJECTIONS

EXPERIMENT 1.—Weight of dog, 12 kg. Blood sugar samples, every ten minutes.

1. 93.0 mg. of blood sugar per hundred cubic centimeters of blood.
2. 93.0.
3. 91.0. Intracutaneous injection of 10 units of insulin.
4. 87.0.
5. 87.0.
6. 75.4.
7. 74.0.
8. 68.9.
9. 74.0.
10. 75.4.

EXPERIMENT 2.—Weight of dog, 15 kg.

1. 91.3 mg. of blood sugar per hundred cubic centimeters of blood.
2. 93.0.
3. 95.2. Intracutaneous injection of 10 units of insulin.
4. 99.0.
5. 98.5.
6. 87.0.
7. 87.0.
8. 80.0.
9. 74.0.
10. 74.0.

The same results were obtained with diabetic dogs, as will be seen in the following protocol:

EXPERIMENT 3.—Weight of dog, 11 kg. Depancreatized two days before the experiment.

1. 172.4 mg. of blood sugar per hundred cubic centimeters of blood.
2. 166.6.
3. 166.6. Intradermal injection of 10 units of insulin.
4. 160.0.
5. 160.0.
6. 153.8.
7. 151.5.
8. 142.8.
9. 131.5.
10. 128.4.

SUBCUTANEOUS INJECTIONS

Subcutaneous injections, on the other hand, are invariably followed by a primary increase in the blood sugar level. The following protocols of normal and diabetic animals illustrate the reaction:

EXPERIMENT 4.—Weight of normal dog, 8.4 kg.

1. 105.0 mg. of blood sugar per hundred cubic centimeters of blood.
2. 102.5.
3. 102.0. Subcutaneous injection of 10 units of insulin.
4. 108.0.
5. 111.0.
6. 112.0.
7. 105.0.
8. 95.2.
9. 93.0.
10. 90.5.

EXPERIMENT 5.—Weight of normal dog, 7.2 kg.

1. 96.6.
2. 97.7. Subcutaneous injection of 10 units of insulin.
3. 130.0.
4. 131.5.
5. 160.0.
6. 157.5.
7. 140.8.
8. 116.8.
9. 124.0.
10. 114.5.

EXPERIMENT 6.—Weight of diabetic dog, 8.4 kg. Depancreatized three days before the experiment. Experiment, July 18.

1. 222.
2. 228.
3. 222. Subcutaneous injection of 16 units of insulin.
4. 238.
5. 227.
6. 222.
7. 219.
8. 189.
9. 156.
10. 124.

In the lymph obtained from the thoracic duct of a normal dog, the rise of the sugar following the intravenous and subcutaneous injection is equally striking.

EXPERIMENT 7.—Normal dog.

15 minute sample.	Sugar, 133 mg. per hundred cubic centimeters of lymph.
15 minutes.	130 mg.
15 minutes.	131 mg.
5 minutes.	133 mg.
Injection of 20 units of insulin.	
5 minutes.	131 mg.
5 minutes.	155 mg.
5 minutes.	168 mg.
10 minutes.	123 mg.
15 minutes.	64.5 mg.
15 minutes.	50.0 mg.
15 minutes.	44.4 mg.
15 minutes.	45.0 mg.
15 minutes.	43.2 mg.
15 minutes.	40.0 mg.

Even with large doses of insulin (we have used up to 400 units) the effect of sugar mobilization from the liver can be determined. In Experiment 8 the effect of 80 units injected subcutaneously (one half) and intravenously on the lymph sugar is demonstrated:

EXPERIMENT 8.—Weight of animal, 9 kg.

	Lymph samples.	
1.	15 minutes.	118 mg. sugar per hundred cubic centimeters of lymph.
2.		117 mg.
	Injection of insulin.	
3.	5 minutes.	125 mg.
4.	5 minutes.	143 mg.
5.	15 minutes.	143 mg.
6.	15 minutes.	115 mg.
7.	15 minutes.	77.5 mg.
8.	15 minutes.	55 mg.
9.	15 minutes.	48 mg.
10.	15 minutes.	47.6 mg.
11.	15 minutes.	42 mg.
12.	15 minutes.	31 mg.

In all the experiments, it has been determined that after intradermal administration of insulin an immediate decrease of the blood sugar level sets in, followed by a continuously decreasing curve.

The picture immediately following subcutaneous administration is quite different. A rise in the blood sugar curve could be determined after all such injections. This rise was frequently of considerable magnitude.

We would not conclude from these experiments, per se, that only glycogenesis is responsible for the decrease of the blood sugar level which instantly follows the intracutaneous injection of insulin had we no other evidence.[2] The instant effect of the intradermal injection, however, points strongly toward such an interpretation. But we can state with absolute certainty that no glucose mobilization follows the intradermal injection, while a distinct increase of the glucose content of the blood stream follows without exception on subcutaneous injection irrespective of the dosage. Increase of glucose in the blood stream without administration of sugar is possible only if glucose is mobilized by glycogenolysis.

This leads to the logical conclusion that insulin present in the circulation initiates glycogenolysis and in this way to mobilization and increase of glucose in the blood and tissues.

LIVER EFFECT VERSUS HORMONE EFFECT

It may seem paradoxical that insulin present in the circulation should increase the blood sugar when hundreds of reports to the contrary have appeared in every language, but our experiments are so conclusive on this point that it may be warrantable to emphasize their practical and theoretical significance. After insulin has been absorbed, and an artificially initiated blood sugar metabolism sets in, depriving the tissues and the circulating fluids of their sugar content, a continuous mobilization of sugar goes on. This is quite in accord with MacLeod's demonstration of a sugar "vacuum" and the knowledge that every lowering of the blood sugar level initiates glucose mobilization by way of autonomic impulses.

This newly mobilized sugar will no longer be demonstrable if the hormone action of the insulin is intense enough, after fifty minutes or so, to metabolize the glucose. Such metabolism will involve sugar previously present in the blood and tissues, as well as newly mobilized material.

The initiated glycogenolysis varies with the individual liver reactivity of animals as with patients. If large, the metabolized sugar will be rapidly replaced and the apparent insulin effect is but small. If only small amounts of glucose are mobilized by a less intense liver reactivity of other individuals, the metabolized sugar cannot be replaced as rapidly. The actual effect on the total blood sugar is then apparently great and the insulin effect is regarded as intensive.

EPINEPHRIN AND INSULIN

It is known that animals, as well as man, respond differently toward epinephrin as far as glucose mobilization is concerned, and in our experience this individual reactivity remains practically unchanged. Rabbits reacting with intensive glucose mobilization after epinephrin always showed an equally intense rise, while others, with only small response, always reacted in this same fashion with later doses.

From a large series, animals were selected which showed marked differences in the sugar curves following like doses of epinephrin (0.5 mg. per kilogram body weight), and these were used for the following comparative experiments:

A rabbit was selected which reacted repeatedly with an increase of its blood sugar content to 125 per cent. of the original level after epinephrin, while a second showed only a 40 per cent. increase under the same condition.

Insulin (0.5 unit per kilogram of body weight) was administered subcutaneously in these animals with the following result: In the former, the insulin apparently produced a slight effect, the blood sugar decreasing only 22 per cent. in two hours with an increase later. The latter showed a decrease of 65 per cent. of its blood sugar after two hours. Such experiments find a ready explanation. The hormone effect of insulin must be

considered equal in both animals. In the first, however, a great part of the metabolized sugar has been replaced by the peculiarly marked glycogenolytic activity of its liver mechanism; in the second rabbit only a small part of the metabolized sugar was so replaced and the insulin effect was apparently, but not actually, much greater.

This explains the individual differences in insulin action after subcutaneous injection in patients, as well as in experimental animals. Many examples of such individual reactivities similar in character were observed in our rabbit series and have, of course, been emphasized by Macleod [3] and other investigators.

Similar individual differences in sugar mobilization occur in human beings, particularly in diabetic patients. We know that the response to insulin depends to a considerable degree on the stage of the disease and the individuality of the patient. It is common experience that, in severe cases of diabetes, the liver has practically lost its glycogenetic power and glucose is mobilized and appears in the blood stream after the slightest disturbance. In such patients much higher doses of insulin are necessary, because too much of the sugar metabolized after insulin injection is promptly replaced by the abnormally augmented glycogenolytic activity of the liver. This fact, because of its connection with insulin shock, has been discussed in another paper.[4]

We have to conclude that individual differences in the reaction of animals and man toward insulin and the habituation toward insulin presumably depend on differences in liver response to sugar mobilizing stimuli. We know that the glycogenolytic activity increases with the severity and progress of diabetes mellitus. This accounts for the difference in the necessary insulin dosage required to lower the blood sugar in such stages of the disease when intensive glucose mobilization rapidly replaces the metabolized sugar.

We have, furthermore, to consider the possibility that the well known habituation toward insulin, with its necessary increase in dosage under certain conditions, is based on a gradually increasing glycogenolytic reactivity of such patients.

Paradoxical as it may seem, the experiments indicate that insulin present in the circulation mobilizes glucose in a manner that seems quite analogous to epinephrin. The intensity of this sugar mobilization depends on the individual glycogenolytic reactivity of the liver; the sugar metabolizing process, based on hormone action, is entirely independent and directly related to the dosage present in the blood stream.

The glycogenolytic activity, one of the outstanding features of the diabetic entity, is markedly increased if insulin is given subcutaneously, and this is particularly noticeable in severe cases by the relatively early habituation toward insulin and the consequent requirement of ever larger dosage.

THE CLINICAL APPLICATION

With subcutaneous insulin treatment, we are certainly able to diminish the actual amount of blood sugar and overcome the dangers associated with continued hyperglycemia. But two features must be clearly distinguished. We must first consider the underlying and as yet unknown derangement, and, secondly, the sequelae of one of its manifestations; namely, the disturbed sugar metabolism, leading to the dangers associated with coma.

The clinically manifest dangers will, of course, be diminished if the sugar metabolism is increased by insulin treatment, a hormone effect which does not necessarily improve the underlying derangement. Indeed, it may intensify one of the outstanding phenomena of the derangement; namely, the abnormal glycogenolytic reactivity of the liver.

Granted that glucose mobilization continues during the time that insulin is present in the blood stream, a strong probability exists that this effect on the liver may actually outlast the hormone effect of the insulin in the tissues. We know from the beautiful experiments of Mann and Magath [5] that with the removal of the liver, mobilization of glucose is excluded, the hormone action of insulin is quite apparently more rapid and intense, and no recovery follows the stage of very low sugar concentration unless glucose is given.

The subcutaneous insulin administration, with its rapid absorption and its action within the circulation and tissues, does not simulate the physiologic mechanism because it initiates glucose mobilization. From clinical experience, we assume that in normal, as in diabetic persons a certain balance is established between glycogensis and glycogenolysis. This balance is, of course, abnormally altered in diabetes, but the body always strives to reestablish a balance even if an abnormally high one. This becomes apparent when insulin is administered and the sugar returns to the preinjection level after the effects have worn off.

With the destruction of sugar in tissues and fluids, more glucose is drawn from the liver, and the already abnormal balance in diabetes is further disturbed. This is true even if we transiently check the symptoms of the disturbed sugar metabolism.

The great discovery of Banting and Best should not be restricted to purely symptomatic treatment, since we know that insulin has a physiologic nerve effect and since we know that this nerve effect can be made available when insulin is deposited intracutaneously.

SUMMARY

1. Insulin absorbed in the circulation initiates an increase in blood sugar by stimulating the liver to mobilize glucose (glycogenolysis).

2. Increased glucose formation and its appearance in the blood stream after subcutaneous insulin injection can be determined directly in the period before the hormone action sets in (from twenty to forty minutes).

3. The continuous mobilization of glucose can be determined by indirect methods, even during the period of hormone action.

4. The reestablishment of the preinsulin level of the blood sugar is probably due to a continued mobilization of glucose. In dehepatized (Mann and Magath) animals, no recovery of sugar values follows after subcutaneous administration.

5. This sugar mobilization or the glycogenolytic reactivity of the liver represents one of the chief factors in the seeming differences which we observe in blood sugar curves of different individuals under apparently similar conditions and with like dosage. This glycogenolytic reactivity probably plays a rôle in habituation toward insulin.

6. The intracutaneous method of administration of insulin in small amounts might seem a more physiologic method for clinical use in less severe cases, in that it avoids glycogenolysis.

3. Macleod, J. J. R., and Orr, M. D.: J. Lab. & Clin. Med. **9**: 591 (June) 1924.

4. Müller, E. F., and Petersen, W. F.: Proc. New York Soc. Exper. Biol. & Med., to be published.

5. Mann, F. C., and Magath, T. B.: Am. J. Physiol. **65**: 403 (July) 1923.

Clinical Notes, Suggestions and New Instruments

AN EASY METHOD OF INDUCING LOCAL ANESTHESIA FOR SIMPLE AMPUTATION OF THE BREAST *

John S. Lundy, M.D., Rochester, Minn.

The injection of the breast for operations under local anesthesia has not always been easy. Some breasts are small enough so that they can be held in the anesthetist's hand and readily injected. Others, however, are so large and unwieldy that they cannot be easily injected. It is particularly for these cases that the technic described here is used. It is seldom used, for instance, in operating on a male breast.

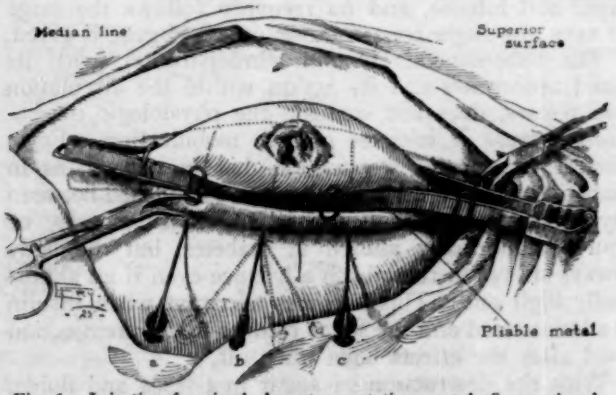


Fig. 1.—Injection for simple breast amputation: metal clamps placed.

The breast and nearby skin are prepared surgically. The breast is held between the hands of the assistant and elevated so that the outline of the base is changed from round to elliptic. When an assistant is not available, a clamp or handle may be used (Fig. 1) made of pliable, firm metal which can be easily bent, in a moment, to hold a breast in the correct shape, and without pain to the patient. When the clamp is in position, its long axis parallels the long axis of the patient's body. A subcutaneous wheal is made with 0.5

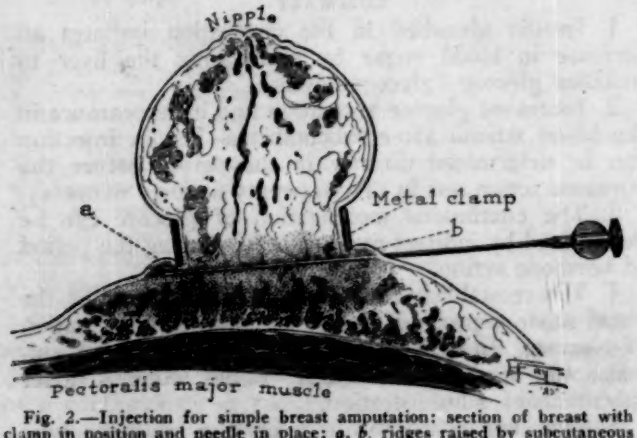


Fig. 2.—Injection for simple breast amputation: section of breast with clamp in position and needle in place; *a*, *b*, ridges raised by subcutaneous infiltration along margins of clamp.

per cent. solution of procain along the lower border of each side of the clamp (Fig. 2 *a* and *b*). The clamp will sometimes slip off a breast unless it is anchored to the cutaneous wheals by towel clips. Metal rings attached to the clamp form loops for the clip to grip (Fig. 1). When one elevates the breast by lifting on the clamp, a space is made for the injection. The base of the breast is narrowed somewhat by the traction on it. Through three lateral punctures, the base of the breast is undermined with the solution to induce sufficient anesthesia so that a sharp needle elicits no pain over that part held in the clamp or between the hands. During this infiltration, the tips of the fingers of the left hand are pressed against the inner edge of the base of the breast. The long needle used in infiltrating the base of the breast is directed inward from the axillary side. The point of the needle can be felt when, at the end of the thrust, it reaches the subcutaneous tissue beneath the left finger tips (Fig. 2 *a*). The needle should not pierce the skin on the mesial side of the breast, and ordinarily but three perforations of the skin of the axillary side are needed to reach any part of the base of the breast with the solution. When released, the breast carries the solution out with it and is ready for operation. The injection forms a layer of solution that isolates the breast from the chest (Fig. 2). The solution lies in and above the pectoral muscles and below the breast. Lumps in the breast are not hidden from the operator by edema, and are therefore not likely to be lost on account of the injection.

The injection is not particularly painful. Anesthesia will last sometimes for one and one-half hours, and I have found it uniformly satisfactory. It permits of mammary incisions and ordinary mammary operations up to, but not exceeding, simple amputation. The solution used is 0.5 per cent. procain in physiologic sodium chlorid solution, with 10 minims of epinephrin to each 100 c.c. The epinephrin may be omitted.

The breast clamp or handle was made for me in the surgical instrument shop of the Mayo Clinic from two strips of hard, rolled monel metal 1.4 by 0.1 by 35 cm., hinged at one end and secured at the other by a series of notches and a movable ring. On each side of the clamp there are three metal loops, the ends of which project slightly beyond the edges of the clamp.

* From the Section on Anesthesia, Mayo Clinic.

PERNICIOUS ANEMIA: REPORT OF A CASE WITH UNUSUALLY LONG REMISSION

Will Howard Swan, M.D., Colorado Springs, Colo.

This case is reported because of the long period of remission, from fourteen to sixteen years.[1] The longest remission that I have found recorded was ten or eleven years, reported by Stockton.[2] His patient was without symptoms, except evidence of achylia gastrica, during that time.

REPORT OF CASE

History.—A man, aged 57, whose mother died of anemia and a brother died of anemia (types not known) while the patient was under observation, entered Glockner Sanatorium, April 26, 1921. The patient was always nervous, and never had been strong. In July, 1903, he was weak, lost weight, and had nausea, with occasional vomiting and palpitation. In three months he was much better. In March, 1904, he was worse, and was seen, June 20 of that year, by Dr. Frank Billings, who made a diagnosis of pernicious anemia. In October, 1904, he was seen by Dr. Charles G. Jennings of Detroit, who concurred in the diagnosis.

He spent three months in Colorado, the dates of which are not clear, and stated that he had been entirely well since, except for indefinite digestive complaints, with suspicion of the appendix and gallbladder, till about March 15, 1921. At this time he became pale, weak, dyspneic, and had nausea and discomfort in the right upper abdomen.

Examination.—The man was pale and slightly yellow, and appeared very ill. There was no enlargement of the lymph glands. Nutrition was fair. The teeth were questionable. The lungs were not abnormal. A faint systolic murmur was heard over the whole precordia, but not transmitted outward. The area was not enlarged. There was a tension of the right rectus muscle, with a little tenderness in the right lower quadrant and in the region of the gallbladder. The spleen and liver were barely palpable. Neurologic examination was negative. The urine showed a trace of albumin and a few hyaline casts. Examination of the blood revealed: hemoglo-

1. The dates as given by the patient on entrance to the hospital, and recorded in the hospital records, are not quite clear. He stated that he remained well for fourteen years, but if he came to Colorado in October, 1904, and was "well" in three months, as he stated, and remained so till March, 1921, the period of remission must have been sixteen years.
2. Stockton, C. G.: Am. J. M. Sc. 158:471 (Oct.) 1919.

bin, 48 per cent.; red cells, 2,208,000; color index, 1.4; white cells, 2,900; polymorphonuclears, 64 per cent.; lymphocytes, 32 per cent.; large mononuclears, 4 per cent. There was marked poikilocytosis and great variation in the size of the red cells, with many large and nucleated forms. There were no malarial plasmodia. The blood Wassermann reaction was negative. The stomach contents showed absence of free hydrochloric acid. The stool showed enormous numbers of *Cercomonas intestinalis*, but no other parasites or ova. There was no occult blood.

Treatment and Course.—Methylene blue was given by mouth and by colonic douche without evident effect on the flagellates or on the condition. There was more or less nausea and complaint of pain in the right upper quadrant, and numbness of the legs. Blood transfusion was given three times, with only temporary symptomatic improvement. The blood findings steadily became worse. Shortly before death, July 7, 1921, the hemoglobin was 14 per cent., and the red cells, 384,000. Only a limited necropsy was allowed. It is interesting that no appparent abnormality was found about the appendix, gallbladder or gall ducts.

COMMENT

For from fourteen to sixteen years this man was symptomatically well except for vague digestive disturbance. His stomach contents were not examined during this time, but it is reasonable to infer that there was lack of hydrochloric acid, as achylia gastrica seems to be persistent during remission, even though other evidences of the disease disappear.

312 Ferguson Building.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

PROTEINS DRIED-MULFORD.—Atopens Dried-Mulford.—Powders representing the protein of substances believed to be the cause of specific sensitization.

Actions and Uses.—See Allergic Protein Preparations, New and Nonofficial Remedies, 1925, p. 278.

Dosage.—Proteins Dried-Mulford are intended for diagnosis only. One Mg. of the dried protein is rubbed into an abrasion of the skin, to which has been applied a drop of physiological solution of sodium chloride or of tenth-normal sodium hydroxide solution. The appearance of an urticarial wheal indicates a sensitiveness to the particular protein used.

Proteins Dried-Mulford are marketed in packages of one capillary tube containing a sterile needle and a sufficient amount of the protein for one test; in packages of six capillary tubes, each containing a sterile needle and sufficient protein for one test; and in vials containing 50 Mg. of the protein.

Manufactured by the H. K. Mulford Company, Philadelphia. No U. S. patent or trademark.

Almond Protein Dried-Mulford[4], *Apple Protein Dried-Mulford*[1], *Asparagus Protein Dried-Mulford*[1], *Banana Protein Dried-Mulford*[1], *Barley Protein Dried-Mulford*[7], *Bean (Lima) Protein Dried-Mulford*[7], *Bean (Navy) Protein Dried-Mulford*[7], *Bean (String) Protein Dried-Mulford*[1], *Beef Protein Dried-Mulford*[2], *Beet Protein Dried-Mulford*[3], *Buckwheat Protein Dried-Mulford*[7], *Cabbage Protein Dried-Mulford*[1], *Cantaloupe Protein Dried-Mulford*[3], *Carrot Protein Dried-Mulford*[1], *Cat Hair Protein Dried-Mulford*[3], *Cattle Dander Protein Dried-Mulford*[3], *Cauliflower Protein Dried-Mulford*[1], *Celery Protein Dried-Mulford*[1], *Chicken Protein Dried-Mulford*[2], *Chicken Feather Protein Dried-Mulford*[3], *Clam Protein Dried-Mulford*[3], *Cocoa Protein Dried-Mulford*[1], *Codfish Protein Dried-Mulford*[2], *Coffee Protein Dried-Mulford*[7], *Coli (Communis) Bacillus Protein Dried-Mulford*[10], *Corn Protein Dried-Mulford*[7], *Cucumber Protein Dried-Mulford*[1], *Diphtheroid (Polyvalent) Bacillus Protein Dried-Mulford*[10], *Dog Hair Protein Dried-Mulford*[3], *Dysentery Bacillus (Polyvalent) Protein Dried-Mulford*[9], *Eggplant Protein Dried-Mulford*[1], *Egg White Protein Dried-Mulford*[8], *Egg Yolk Protein Dried-Mulford*[8], *Flaxseed Protein Dried-Mulford*[11], *Friedlander Bacillus Protein Dried-Mulford*[10], *Goose Feather Protein Dried-Mulford*[3], *Gonococcus Bacillus (Polyvalent) Protein Dried-Mulford*[10], *Guinea-Pig Hair Protein Dried-Mulford*[3], *Horse Dander Protein Dried-Mulford*[3], *Horse Serum Protein Dried-Mulford*[6], *Influenza Bacillus Protein Dried-Mulford*[10], *Kapok Protein Dried-Mulford*[12], *Lamb Protein Dried-Mulford*[2], *Lettuce Protein Dried-Mulford*[1], *Lobster Protein Dried-Mulford*[2], *Mackerel Protein Dried-Mulford*[2], *Meningococcus Bacillus (Polyvalent) Protein Dried-Mulford*[10], *Micrococcus Catarrhalis Bacillus Protein Dried-Mulford*[10], *Milk Protein Dried-Mulford*[2], *Mushroom Protein Dried-Mulford*[3], *Oat Protein Dried-Mulford*[7], *Onion Protein Dried-Mulford*[1], *Orange Protein Dried-Mulford*[1], *Orris Root Protein Dried-Mulford*[4], *Oyster Protein Dried-Mulford*[2], *Paratyphosus Bacillus A Protein Dried-Mulford*[10], *Paratyphosus Bacillus "B" Protein Dried-Mulford*[10], *Pertussis Bacillus (Polyvalent) Protein Dried-Mulford*[10], *Pea Protein Dried-Mulford*[7], *Peanut Protein Dried-Mulford*[4], *Pepper (Black) Protein Dried-Mulford*[4], *Pneumococcus Bacillus (Polyvalent) Protein Dried-Mulford*[9], *Pork Protein Dried-Mulford*[2], *Potato Protein Dried-Mulford*[7], *Rabbit Hair Protein Dried-Mulford*[3], *Rice Protein Dried-Mulford*[7], *Rice Powder (Polish) Protein Dried-Mulford*[7], *Rye Protein Dried-Mulford*[7], *Salmon Protein Dried-Mulford*[2], *Spinach Protein Dried-Mulford*[1], *Squash Protein Dried-Mulford*[1], *Strawberry Protein Dried-Mulford*[1], *Sheep's Wool Protein Dried-Mulford*[3], *Staphylococcus Bacillus (Albus and Aureus) Protein Dried-Mulford*[10], *Streptococcus Bacillus (Polyvalent) Protein Dried-Mulford*[10], *Sweet Potato Protein Dried-Mulford*[1], *Tea Protein Dried-Mulford*[5], *Tomato Protein Dried-Mulford*[1], *Tobacco Protein Dried-Mulford*[7], *Tubercle Bacillus (Human) Protein Dried-Mulford*[10], *Tubercle Bacillus (Bovine) Protein Dried-Mulford*[10], *Typhosus Bacillus Protein Dried-Mulford*[10], *Veal Protein Dried-Mulford*[2], *Walnut Protein Dried-Mulford*[4], *Wheat Protein Dried-Mulford*.[7]

Products marked (1) are prepared by the following method: The peel, if any, is removed, the substance is minced in a grinder. The ground material is spread out on pans and placed in an incubator at 37.5 C. until thoroughly dried. It is then powdered in a mortar and sifted through a fine bolting cloth.

Products marked (2) are prepared in the following manner: The substance is minced in a grinder and acetone is added. It is shaken thoroughly and transferred to a filter. More acetone is added until all traces of fat are removed. The acetone is then evaporated off and the residue is powdered in a mortar and sifted through fine bolting cloth.

Products marked (3) are prepared in the following manner: The substance, immersed in a 0.2 per cent. solution of sodium hydroxide, is subjected to heat at 65 C. for one hour. After cooling, the mixture is strained through cheese cloth, paper filtered, and precipitated with acetic acid (36 per cent.). The precipitate collected is redissolved in 0.2 per cent. solution of sodium hydroxide, filtered, and again precipitated with acetic acid. The precipitate collected is dried, powdered in a mortar, and sifted through bolting cloth.

Products marked (4) are prepared in the following manner: The shell, if any, is removed, and the substance is ground through a fine meat grinder (when required), and the oil extracted with ether. The residue is then powdered in a mortar and sifted through bolting cloth.

Products marked (5) are prepared in the following manner: The white and yolk, respectively, are separated, and coagulated with acetone. Each is then dried, ground and sifted.

Products marked (6) are prepared in the following manner: The serum is evaporated to dryness without the application of heat. The dried substance is then ground to a powder.

Products marked (7) are prepared in the following manner: The substance is treated for one hour with a 0.2 per cent. solution of sodium hydroxide. The mixture is strained through cheese cloth, paper filtered, and precipitated with acetic acid (36 per cent.). The precipitate collected is redissolved in 0.2 per cent. solution of sodium hydroxide, filtered and again precipitated with acetic acid. The precipitate collected is dried, powdered in a mortar, and sifted through bolting cloth.

Products marked (8) are prepared in the following manner: The substance is washed in chloroform and allowed to dry. It is then ground in a mortar and sifted through a bolting cloth.

The product marked (9) is prepared in the following manner: The milk is precipitated with acetic acid (36 per cent.). The precipitate is collected, and allowed to dry. It is then ground in a mortar and sifted through a bolting cloth.

The products marked (10) are prepared in the following manner: A large growth of bacteria is harvested from a common culture medium, washed with sterile distilled water, and dried. The drying process includes rubbing the bacterial harvest in a mortar with equal parts of acetone and ether, repeating the process as often as necessary. The resulting paste is extracted with ether until it is thoroughly powdery when dried. It is then ground in a mortar and sifted.

The products marked (11) are prepared in the following manner: The seed is ground, washed with ether, extracted with 0.2 per cent. solution of sodium hydroxide, filtered, and precipitated with acetic acid. The precipitate is dried and powdered.

The product marked (12) is prepared in the following manner: The fiber is extracted with 0.2 per cent. solution of sodium hydroxide at 65 C. for four hours, filtered, and precipitated with acetic acid. The precipitate is dried and powdered.

RADON (See New and Nonofficial Remedies, 1925, p. 313).

Radon-Standard Chemical Co.—A brand of radon-N. N. R. It is supplied in the form of "implants" (minute glass tubes suitable for embedding in tumors) and in the form of larger tubes. Radon-Standard Chemical Co. is sold on the basis of its gamma ray activity, as determined by comparison with a radium standard.

Manufactured by the Standard Chemical Co., Pittsburgh (Radium Chemical Co., Pittsburgh, distributor). No U. S. patent or trademark.

The County Health Officer.—In the absence of specific legal authority to name or to approve the appointment of the county health officer, the use or the withholding of state financial aid often serves the purpose. The position should be removed from partisan political control on the part either of the state or of the county, and the local authorities should be given all possible responsibility with efficient service. The county medical society's support of the project is important, and, where the laws permit, its indorsement of the person appointed as health officer should be secured.—Parran, Thomas, Jr.: *Pub. Health Rep.* **40**:986 (May 15) 1925.

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SATURDAY, SEPTEMBER 12, 1925

IMMUNIZATION OF ANTHROPOID APES AGAINST TUBERCULOSIS

The first detailed report of a long projected experiment on the vaccination of monkeys against tuberculosis in their native environment has recently been published. From time to time[1] there have appeared in French medical literature accounts of research on the immunizing power of a bacillary vaccine, prepared by Calmette and Guérin, and called for simplicity BCG. This vaccine consists of tubercle bacilli greatly reduced in virulence by prolonged cultivation on potato or agar saturated with bile containing 5 per cent. glycerol. Calmette and Guérin have repeatedly asserted that this vaccine confers immunity without producing anatomic tubercle. According to Calmette,[2] the only effect of massive injection of this bacillus is "general disease which is like typhoid fever and which cures itself spontaneously after fifteen to twenty days without producing the slightest tubercle formation." Yet calves, guinea-pigs, rabbits and monkeys treated with doses of a few milligrams of the substance, according to the accounts, appear to become highly resistant to infection with virulent tubercle bacilli.

The latest stage of this investigation, a phase planned by Calmette years ago, but postponed by the war and the distress left in its wake, has dealt with the infection of man's nearest biologic relations in their natural environment. A series of experiments truly romantic in their conception and prosecution have been carried out in a tropical environment on the coast of French West Africa, under the auspices of the newly created Pasteur Institute of Kindia. The effort has been made to simulate human conditions as far as is possible in any animal experiment, through the use of the manlike apes and chimpanzees, close to their native home and exposed to infection in natural ways, but under scientific control. One may perhaps judge how earnest has been the effort to approximate human rather than laboratory conditions, by the designations conferred on the research material of this simian colony, which answers not to the A_1 or B_{25} of the usual laboratory experiment, but to the more sympathetic appellations of Gertrude, Hector, Ginette, Jacques, Catherine and Tonio.

The results reported by Wilbert,[3] who states that the program of Calmette has been followed, may be thus summarized: Fifteen chimpanzees were studied in three groups. The fifteen included three that were vaccinated with BCG, five that were infected with virulent tubercle bacilli, and seven normal animals, which served as nonvaccinated controls. The groups were so constituted that vaccinated and nonvaccinated animals were exposed equally to infection from the artificially infected animals. The five infected chimpanzees all died of tuberculosis. Of the seven exposed, nonvaccinated controls, four died of tuberculosis and three of intercurrent, nontuberculous infection. The three vaccinated animals have remained in good health. Fifty-nine apes lived under similar conditions of mutual exposure. Of these, nineteen were vaccinated, twenty were infected with virulent tubercle bacilli, and twenty served as noninfected, nonvaccinated controls. Of the nineteen vaccinated, eleven died of various causes without showing any evidence of tuberculosis at necropsy. The other eight have remained in good health. Of the twenty nonvaccinated controls, nineteen died of tuberculosis and one of intercurrent acute infection. Of the twenty infected animals that were allowed to spread their infection to the other animals of the series, nineteen died of tuberculosis and one of intestinal obstruction.

Two methods were used in the vaccination, ingestion and subcutaneous inoculation. They proved equally effective. One hundred milligrams of BCG was tolerated by the animals without harm. No tuberculous lesions were produced by the vaccine. The only change noted was a transient swelling of the lymph nodes regional to the site of subcutaneous inoculation. The usual procedure was subcutaneous inoculation with 50 mg., or five ingestions of 50 mg., each at intervals of from eight to ten days. In a few instances, the vaccination was repeated after some months. Wilbert is satisfied that the means employed have conferred resistance lasting at least one year, and that new protection can be given by revaccination.

The results are promising, to say the least. They are presented by Wilbert in condensed form, with little comment and without extravagant claim. The spirit of the report is that which has animated this investigation since its inception fifteen years ago: free imagination in its planning, but conservatism in the reporting and interpretation of results. Throughout

1. Artificial Immunization Against Tuberculosis, editorial, J. A. M. A. **76**: 314 (Jan. 29) 1921. Calmette, A., and Guérin, C.: Vaccination des bovidés contre la tuberculose et méthode nouvelle de prophylaxie de la tuberculose bovine, Ann. d. l'Inst. Pasteur **38**: 371 (May) 1924.

2. Calmette, A.: L'infection bacillaire et la tuberculose, Ed. 2, Paris, Masson & Cie, 1922, p. 608.

3. Wilbert, J.: Expériences de vaccination des singes contre la tuberculose par le BCG, Ann. d. l'Inst. Pasteur **39**: 641 (Aug.) 1925.

its course a temperate reluctance to publish prophecy has been exhibited, and in the latest article no hint is given of the hopes or fears of the author and his collaborators concerning that toward which they are obviously striving, vaccination in man.

The members of the medical profession, however, are veterans with respect to tuberculosis cures and immunizing methods. Thirty years of dashed hopes have followed Koch's first reports of the immunizing properties of tuberculin. It takes more than one favorable report now to convince any one of any discovery in the therapy of tuberculosis. The present attitude is a skepticism directly proportional to the enthusiasm of the latest claimant in the fertile field of tuberculosis cures, which for years has produced at least one sure tuberculosis remedy a month. The Calmette method, on the other hand, has been developed with such steadiness of purpose and simplicity of claim as to command close attention and constantly interested expectancy.

THE SEMICENTENNIAL OF THE AMERICAN AGRICULTURAL EXPERIMENT STATIONS

Medical education can no longer be described or discussed apart from general education. It is likewise true that the medical sciences cannot be intelligently considered apart from the natural and physical sciences in general. The special studies of the medical student, as Flexner has remarked, begin everywhere with physics, chemistry and biology. The investigator—even the clinical investigator—is constantly driven back on them; not only does he need good fundamental training in the basic sciences before beginning his medical course, but from time to time he must endeavor by contact and study to keep himself fairly abreast of their progress. Without a firm and clear grasp of the basic sciences, Flexner adds, the practitioner cannot comprehend his medical subjects as a student, or read and utilize the current literature when in practice.

We have become accustomed to think of agriculture as an art so far apart from medicine that we rarely stop to consider how much of the scientific background of these vocations is common to the two or how much their scientific experiences interplay. The agriculturist, like the physician, is emerging from the artisan type; he is seeking to formulate his endeavors in a rational manner and to replace empiricism by scientific formulas wherever this has become possible. Allen [1] has recently pointed out that the nineteenth century not only witnessed the greatest revolution in farm practice the world had known but also ushered in the beginning of systematic research in agriculture, notably in agricultural chemistry. This development has brought with it innumerable contributions from which medical sciences have benefited greatly. Agriculture deals with manifestations of life both in plants and in animals. The analogues of their functions are found in large measure in the human organism. The principles of growth, the laws of heredity, the fundaments of biochemistry, biophysics, bacteriology and pathology are of common interest. Our medical eyes too infrequently see the outlying beginning of our interests in the domain of other vocations.

The coming days are to celebrate the establishment in America of the agricultural experiment station, "that powerful agency for applied science that has few counterparts, and that has spread to every civilized country." A national observance will take place in October at New Haven, in Connecticut, where the station system started fifty years ago with an appropriation of less than $3,000. Today the experiment stations, with an aggregate maintenance fund of $10,000,000 a year, together with the federal Department of Agriculture, constitute one of the most powerful agencies for the benefit of human welfare and well being.

The discovery of the transmission of disease by an insect vector may rightly be regarded as a by-product of agricultural research, since it had a beginning in the study of disease of cattle carried by a tick. In large measure the study of human food and nutrition in this country originated from the experiment stations. The work done there and in the federal bureaus has been one of the chief means of bringing home the importance of proper nutrition and the basis for it. Allen has reminded us that the subject of vitamins, their sources, the types of malnutrition, such as rickets and scurvy, and other deficiency disorders has long engaged the attention of the experiment stations. Hence the medical fraternity rejoices with the devotees of agriculture in hailing a semicentennial anniversary reminiscent of notable scientific achievements in channels that were new.

THE METABOLIC DIFFERENCES BETWEEN CANCER CELLS AND NORMAL CELLS

While the pathologists have been looking for either a specific exciting cause or a specific diagnostic reaction for cancer, the biochemists have been searching for some characteristic chemical or functional peculiarity in the cancer cells that might explain their behavior, and perhaps their pathogenesis. For the most part the efforts of both groups of investigators have been unsuccessful. Such methods as we have for tissue analysis have failed to show wherein cancer cells differ from the cells from which they have taken their origin. This is not surprising in view of the relative crudeness of the available methods and the fact that they concern themselves merely with the dead protoplasm and not with the living cells. Furthermore, even such a refined immunologic method as the complement fixation test fails to disclose the presence in

1. Allen, E. W.: Research in the Service of the State, Science 62:165 (Aug. 21) 1925.

cancer of any protein or other antigenic substance that is peculiar to cancer tissue. That no great chemical difference exists between cancer cells and normal cells is further attested by the fact that the two may be capable of manufacturing the same sorts of complex metabolic products; for example, a cancer arising in the thyroid may manufacture thyroxin and store iodin, a melanotic tumor produces the same sort of pigment as do cells from which it arose, and a carcinoma of the skin produces keratin identical with that formed by normal cutaneous epithelium.

Evidently, then, if there are chemical differences between normal cells and cancer cells, these are probably quantitative rather than qualitative. Of course, it is not so satisfactory to demonstrate relative as it is to demonstrate absolute differences, but so far this seems to be the best that can be done. Like all rapidly growing tissues, the cancer cells have a relatively large proportion of water and potassium; but their proteins seem to be made up in the same way as normal proteins. Their equipment of enzymes seems also to be about the same as in normal cells, although the extensive studies of Falk[1] and his colleagues on the enzymatic action of extracts of cancer tissue seem to show that proteolysis and lipolysis are less active and perhaps of somewhat different character than with extracts of normal tissues, at least under the conditions of their experiments. Investigations of the oxidative or respiratory mechanism of tumors have of late been particularly active, with some suggestive results. Much of this work has been carried out in the laboratory of Otto Warburg in Berlin, who, while in this country last year, presented a concise review of the results obtained.[2] The starting point of Warburg's studies lay in the observation that the respiration of sea urchin eggs increases sixfold immediately after fertilization, presumably to supply energy for growth. This led to the assumption that rapidly growing cancer cells should show a correspondingly high rate of respiration; but experiment showed that the reverse was the case, for the cancer cells use much less oxygen than normal tissues under the same experimental conditions. It was soon found that this is because the cancer cells produce from glucose large quantities of lactic acid, which soon inhibits cell activity unless neutralized. Now the formation of lactic acid from glucose is an important method of securing energy without oxidation, for glucose splits directly into lactic acid according to the equation, $C_6H_{12}O_6 = 2\,C_3H_6O_3$. Hence lactic acid is characteristically produced under conditions of asphyxia, for when oxygen is present the lactic acid is promptly burned.

Warburg has found that tumor cells exhibit as a metabolic characteristic the tendency to form relatively large amounts of lactic acid from glucose, not only when asphyxiated but even when oxygen is supplied. How tremendous this splitting metabolism is becomes clear on a comparison with the well known data available on glycolysis in blood or frog muscle. In a unit time, tumor tissue produces 100 times as much lactic acid as does blood, 200 times as much as frog's muscle at rest, and eight times as much as frog's muscle working to the limit of its normal efficiency. When cancer tissue attacks glucose in the presence of oxygen it does burn some of the lactic acid, but still it forms much more lactic acid than normal tissues do under the same condition; that is, the metabolism of normal tissues is predominatingly oxidative, while with cancer tissue oxidation is subsidiary to glycolysis, with lactic acid formation as the end-result. Benign tumors seem to be intermediate between malignant and normal tissues in these respects, corroborating the experience gained from pathology; namely, that the differences between malignant and benign tumors are differences in degree rather than in kind. Normal embryonic tissue is again intermediate between benign tumors and resting adult tissues, in that while much lactic acid is formed under anaerobic conditions, in the presence of oxygen little or no lactic acid is formed. Evidently, then, glycolysis is a characteristic feature of growing tissues, and Warburg believes that in the development of carcinomas there is at first the embryonal condition with the large anaerobic glycolysis and a respiration that is in accord with it. In the course of development there follows a stationary condition of the epithelium, with an anaerobic glycolysis that has fallen to one tenth, and with a high respiration. From this stationary condition develop carcinomas, in which the glycolysis again rises tenfold, without a corresponding rise in respiration. The same holds true, so far as we can say at present, for the development of sarcomas from resting connective tissue.

This shows what occurs when a carcinoma or sarcoma arises, but it does not show why it occurs. The observations all point to the view, which has often been suggested by those studying with microscopes the development of cancers, that local oxygen deficiency may lie at the bottom of cancer formation. Warburg suggests that resting epithelium is a mosaic in which few cells glycolyze strongly, while the greater number of the cells do not glycolyze at all. If such a mixture of cells suffers an oxygen deficiency, as by pressure, sclerosis, action of bacteria or other influence, then those cells which are not able to glycolyze must die, while those which are able to glycolyze can continue to live. If the oxygen deficiency continues, then there will arise tissue possessing the glycolytic activity of embryonal tissue; but, since grown under conditions of oxygen want, tissue whose respiration is abnormally slight—in other words, tumor tissue. It remains to be seen whether this hypothesis, which substitutes for the current conception of "irritation" that of "oxygen

1. Falk, K. G.: Chemistry of Enzyme Actions, New York, the Chemical Catalog Company, 1924.
2. Warburg, Otto: The Metabolism of Cancer Cells, J. Cancer Res. 9: 148 (March) 1925.

deficiency," will hold up under future investigation. It at least furnishes chemical support for a theory that has been suggested by anatomic considerations, and also seems to show a more striking metabolic difference between cancer cells and normal cells than had previously been known. There is also some support for the idea that cancer tissue is highly glycolytic in the human body as well as in the test tube experiments, for Braunstein [3] has observed that the development of cancer in patients with diabetes reduces hyperglycemia and increases sugar tolerance.

Current Comment

GLYCEROL—A SUGAR FORMER

It would not be difficult to point in the literature of the physiology of nutrition to evidences that glycerol, or glycerin, as it is more popularly termed, can give rise to sugar in metabolism. This reaction is taken into account at present in estimating the antiketogenic potencies of diets for the patient with diabetes. Just as proteins represent a potential sugar-yielding capacity equivalent to more than half their weight, fats appear to be antiketogenic in proportion to the amount of glycerol that they can yield in their hydrolysis. Despite these well founded features, it is still customary in some quarters to countenance the use of glycerol as a sweetening substitute for sugar in the dietary of diabetic patients. The exchange is of dubious propriety. If further evidence were necessary, it might be found in the recent demonstration that glycerol will combat the symptoms associated with the hypoglycemia of overdosage with insulin. Furthermore, it has been shown in the Hygienic Laboratory of the U. S. Public Health Service [4] that, in animals, glycerol may produce a hyperglycemia of considerable extent and duration, indicating a conversion of the substance into glucose. There is no longer any excuse for misunderstanding.

THE CIRCULATION IN THE ARM

When the hand is suitably warmed, the blood flow assumes a rapidity that makes the circulating fluid arriving in the superficial veins of the part retain its arterial character. This phenomenon is so pronounced that it has recently been proposed to employ the analysis of the hand vein blood in a routine way for securing an index of the composition of arterial blood. It has been known for some time that the oxygen content of "cutaneous blood" obtained from an incision in the skin of the finger is almost identical with that of arterial blood. Goldschmidt and Light [5] of the University of Pennsylvania have recently pointed out in this connection that the rapidity of the blood flow is not the only factor responsible for the arterial character of the blood in the veins of the hand. They have directed attention to the low utilization of oxygen by the tissues of this part. The hand is, mostly, a bony skeleton covered with skin, with only a small amount of tissue that has a vigorous metabolism. The muscles responsible for the movements of its parts are situated principally above the wrist. Consequently, the chemical changes in the hand are relatively lower than those representing the metabolism of the muscular forearm. According to the Philadelphia physiologists, the more superficial veins of the forearm may have a blood of a higher oxygen saturation and a lower carbon dioxid content than deeper veins have. This they regard as evidence that the former blood is derived chiefly from the skin. Closely adjacent veins of the forearm may exhibit differences in their content of blood gases. Rapid blood flow through the hands has been assumed also to facilitate the regulation of body temperature by promoting loss of heat, when this is essential. Goldschmidt and Light offer the suggestion that if the hand is an area of low oxygen consumption due to a paucity of tissue capable of a high level of metabolism, perhaps it is inherently incapable of maintaining its own temperature by its intrinsic heat production. In that event the hand must depend in some measure on the heat of the blood passing through it, which, in turn, would necessitate a comparatively rapid flow of blood. Even the anatomic arrangements in the blood vessels of the fingers seem to facilitate a "continuous flow" in them.

HISTIDIN—A PRECURSOR OF URIC ACID

It has become a familiar biochemical fact that uric acid, a compound about which volumes have been contributed to medical literature, is derived from certain closely related organic substances, the purins. An intake of purin-yielding food, such as liver or sweetbread, is promptly followed by an augmented output of uric acid in the urine. The same end-product arises when there is an extensive breakdown of nuclear matter, such as leukocytes, within the body itself. In leukemia there may consequently be enhanced production of uric acid. But uric acid is present in normal amount in the blood and excreted to some extent, at least, in healthy persons even when they have long subsisted on essentially purin-free diets. This fact has represented a puzzle for the physiology of metabolism, for it is scarcely to be assumed that purins are continually being liberated and oxidized to uric acid in the body without some restitution. How, then, can the purins of nuclear material, and thus uric acid itself, be synthesized in the absence of preformed purins in the food intake? Are they produced de novo from very simple compounds? Heretofore, the evidence has been essentially negative; but the experiments of Rose and Cook [1] at the University of Illinois point to histidin as a likely precursor. This amino-acid is a disintegration product of practically all edible proteins. Feeding experiments show clearly that histidin is one

3. Braunstein, A.: Klin. Wchnschr. **3**: 788 (April 29) 1924.
4. Voegtlin, Carl; Thompson, J. W., and Dunn, E. R.: Hyperglycemia Produced by Glycerol, J. Biol. Chem. **64**: 639 (July) 1925.
5. Goldschmidt, L., and Light, A. B.: A Comparison of the Gaseous Content of Blood from Veins of the Forearm and the Dorsal Surface of the Hand as Indicative of Blood Flow and Metabolic Differences in These Parts, Am. J. Physiol. **73**: 127 (June) 1925.

1. Rose, W. C., and Cook, K. G.: The Relation of Histidine and Arginine to Creatine and Purine Metabolism, J. Biol. Chem. **64**: 325 (June) 1925.

of the growing list of known indispensable amino-acids. If the conclusions of Rose and Cook prove to be entirely tenable, as now seems likely, we may reason that histidin is an essential in nutrition because it is required for nuclear synthesis, in which purins play an outstanding part.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Personal.—Dr. Royal J. Calcote, secretary of the Pulaski County Medical Society and treasurer of the Arkansas State Medical Society, has resigned as medical examiner of the U. S. Veterans' Bureau, which position he has held since 1921, and will resume private practice in Little Rock.

CALIFORNIA

Delinquent Narcotic Registrations.—Collector of Internal Revenue Goodcell, Los Angeles, has notified about 500 physicians, dentists, druggists and others who failed to register and pay the tax for the fiscal year 1925-1926 that after fifteen days their cases would be turned over to federal investigators, and that those who were continuing to dispense narcotics would be liable to prosecution under the Harrison Narcotic Law.

Sued for Changing Letter into Testimonial.—It is reported that a Mrs. Walter F. Keene, Los Angeles, has brought suit for $25,000 against the Brookman Products Company, which manufactures a liniment for rheumatism, on the charge that a letter of hers had been changed and made into a testimonial. Mrs. Keene alleges that a statement to the effect that she had been relieved through the use of the liniment had been changed to read that had it not been for the remedy she probably would not have recovered.

Craddick's "Triclast."—The state board of medical examiners is investigating the case of Joel Edward Craddick, Huntington Beach, to determine whether his "electric robe" treatments have been in violation of the state medical laws. The investigation is said to have been precipitated by the death last April of a patient whom Craddick had under his care. Craddick calls the "electric robe" the "triclast," which is manufactured by the Triune Health Plan of Denver, of which Craddick says he is general manager. The apparatus covers the patient's entire body except the head, and is electrically wired. The patient removes his clothing, dons a rubber bathing suit, puts on "the electric robe," connects it to an electric light plug, and turns on the current. Craddick claims to have treated about 300 persons in the last three months.

CONNECTICUT

Certified Oysters.—State regulations require that oysters sold for food in Connecticut be taken from beds that are certified to by the state department of health as being free from contamination, and that all persons engaged in packing, opening, or handling shucked oysters have a certificate from the state department of health showing that bacteriologic examination has been made of the urine and feces and that they were negative for typhoid and paratyphoid bacilli. The certificate must be renewed each year and after an illness suspected of being typhoid fever. No person shall be employed as a shucker unless he holds such certificate, and who does not carry his certificate with him at all times.

DISTRICT OF COLUMBIA

"The Cosmopolitan University."—It is reported that the so-called "Oriental University," Washington, D. C., whose charter was revoked, Dec. 25, 1923, has secured another charter and will now operate an institution at Popular Hill, Maryland, under a new name, "The Cosmopolitan University."

GEORGIA

Personal.—Dr. Charles T. Nellans has assumed the duties of physician to the federal penitentiary at Atlanta, to succeed Dr. Andrew F. Quillian, resigned.——Dr. Henry G. Mealing, Augusta, has been appointed instructor in medicine in charge of clinical laboratories and assistant physician to Johns Hopkins Medical School, Baltimore.——Drs. Julius D. Johnson, Augusta, and Herbert S. Alden, Decatur, have been appointed assistant resident physicians at the University of Cincinnati.——Dr. Silas C. Rutland, La Grange, has been appointed head of the Troup County Board of Health, to succeed Dr. Carp S. Kinzer, resigned.

ILLINOIS

Hospital News.—The cornerstone of the Merryville Sanitarium at Aurora was laid, August 16. The institution will be conducted by the Sisters of Mercy.

Chiropractor Guilty.—Murray R. Hollowell, a chiropractor of Herrin, was found guilty, August 15, of violating the state medical practice act, it is reported. Hollowell is said to be one of the last chiropractors to practice in Williamson County.

Illegal Practitioner Arrested.—Chief Gray Eagle, an Indian, who has been conducting a "medicine show" at Peoria, was arrested, August 17, on a charge of practicing medicine without a license.

Society News. — Dr. James E. Bellinger, Collinsville, addressed the Madison County Medical Society, Edwardsville, September 2, on "Medicine in the Orient."——The Alton County Medical Society held its annual dinner, August 16, at the Rock Springs Country Club.

INDIANA

Society News.—Twenty-five physicians of Lafayette recently were the guests of Dr. Samuel Pearlman at his summer cottage near Tecumseh Trail.——Members of the Kosciusko County Medical Society held an outing at Webster Lake, July 23, and were addressed by the secretary of the Indiana State Medical Association following a dinner at the Yellow Banks Hotel.

Purdue University's Summer Camps.—The extension division of Purdue University, in cooperation with the state board of health, has for three years fostered summer camps for boys and girls throughout the state. There were fourteen camps this year, with an average of about 200 boys and girls from rural communities in attendance. The state board supervised the sanitation of these camps, the first aid treatment, and the daily "medical talks." The camps were at Vincennes for the counties of Knox, Greene, Washington and Sullivan, and Norman Beatty was the sanitary director; at Versailles for the counties of Ohio, Ripley, Dearborn and Switzerland, and Dr. Arthur L. Oilar was sanitary director; at Valparaiso for the counties of LaPorte, Porter and Lake, and Dr. Harvey W. McKane was the sanitary director; and at Monticello for the counties of White, Carroll and Jasper, and Dr. Thurman B. Rice was the sanitary director.

KANSAS

Dr. Reed Resigns.—C. I. Reed, Ph.D., Lawrence, has resigned as a National Research Council Fellow and as associate professor of physiology, University of Kansas Medical School, to accept the position of associate professor of physiology at Baylor University College of Medicine, Dallas, Texas.

LOUISIANA

Health Unit Reestablished.—The police jury of DeSoto Parish at a recent meeting voted $4,000 appropriation to reestablish the health unit, discontinued a few months ago.

Tuberculosis Clinic.—The New Orleans Anti-Tuberculosis League has opened a third morning clinic which provides clinic service on Monday, Wednesday and Friday. More patients were cared for in the first seven months of this year than during all of 1924.

Milk Conference.—Representatives from every dairy association and other agencies connected with the milk interests have been invited by the state board of health and the milk regulation board to a conference in New Orleans, September 19, to consider the production and sale of milk and milk products in Louisiana and to obtain the cooperation of all concerns in a revision of the dairy laws.

Daylight Milk Delivery.—At a meeting of representatives of New Orleans dairies, the superintendent of the city board of health announced plans to change the time of delivery of milk from early morning hours to the hours of from about 7 a. m. to 7 p. m. Dairymen protested at this meeting against the limit of 100,000 bacteria per cubic centimeter of milk, as allowed in the new ordinance, and suggested a maximum count of 200,000.

Society News.—The Ouachita Parish Medical Society furnished the scientific program at the July meeting of the Shreveport Medical Society at the Charity Hospital, Shreveport. Dr. David I. Hirsch spoke on "The Early Diagnosis of Intestinal Obstruction," and Dr. Francis C. Bennett on "The Use of Nonspecific Proteins in Eye Diseases."——The guest of honor at the August meeting of the Avoyelles Parish Medical Society at Cottonport was Dr. Sylvain B. Wolff, Opelousas, who addressed the society on gunshot wounds.

MAINE

Medical Mayors in Maine.—The *Journal of the Maine Medical Association* notes that recently Dr. Robert J. Wiseman, Lewiston, Dr. Lewis Hodgkins, Ellsworth, and Dr. P. R. Baird, Waterville, have been elected mayors of their respective cities.

Society News.—The Penobscot County Medical Society held a special meeting recently at Newport, and its members were the guests of local physicians. The afternoon was spent at Camp Benson on Sebasticook Lake; in the evening there was a banquet at Josier Inn; Dr. Silas C. Blaisdell, New York, was the principal speaker.

Personal.—Dr. Henry S. Mathewson has been relieved from duty at the Marine Hospital at Portland and ordered to Providence, R. I., for duty, and Dr. George Parcher has been ordered to the Marine Hospital at Portland to succeed Dr. Mathewson. Dr. Parcher formerly served in the Marine Hospital Service at San Francisco and was attached to the office of the superintendent of the foreign marine service, Staten Island, N. Y.

MARYLAND

Typhoid Fever Increase.—Reports from the state department of health show that there were 197 cases of typhoid fever reported in August, in comparison with 156 in August, 1924.

Meat Inspection.—The meat inspection division of the Baltimore City Health Department, recently organized by Dr. Charles Hampson Jones, commissioner of health, began operating, September 1, under the direction of William Brenner. Carrying out the provisions of the meat ordinance passed by the city council, an inspection is being made of slaughterhouses and other places where meat is prepared for sale in the city.

Study of Tropical Animal Life.—Curt P. Richter, Ph.D., of the Henry Phipps Psychiatric Clinic, and Dr. George B. Wislocki, of the department of embryology, Johns Hopkins University, have returned from Central America, where they studied tropical animal life; most of their time was spent at the Institute for Research in Tropical America, which has quarters on an island in Gatun Lake, in the Canal Zone. The institute is maintained by the National Research Council, and by Harvard, Michigan and Johns Hopkins universities. The government has made a preserve of the island so that all forms of life may remain in their primitive environment.

Appointments to Staff of Wilmer Eye Institute.—Appointments to the staff of the Wilmer Eye Institute at Johns Hopkins University Medical School, Baltimore, have been announced as follows: Dr. William Holland Wilmer, director; Dr. Cecil H. Bagley, resident ophthalmologist and instructor in ophthalmology; Drs. Leo J. Goldbach, Alan C. Woods and Clyde A. Clapp, associates in clinical ophthalmology; Drs. Reginald D. West and Dobert Y. Fechtig, instructors in clinical ophthalmology; Drs. R. S. Wygodski, Bernard V. Kelly, Joseph E. Brumbach, Joseph G. O'Brien, Aaron Robinson, Franklin Hazlehurst, Jr., Chester E. Hurwitz, Frank A. Pacienza and Frederick A. Holden, assistants in clinical ophthalmology. Charles L. Burky will do research work. Those who will devote full time to the institute (having no private practice) are Drs. Wilmer, Bagley and Wygodski. The institute will open, October 1, with sixty beds in the Nurses' Home Building of the Johns Hopkins Hospital group; this adjoins the administration building.

MICHIGAN

Luncheon to Colonel Keller.—Former officers of Base Hospital No. 17, which was at Dijon, France, attended a luncheon, August 17, at the Detroit Athletic Club in honor of Col. William L. Keller, M. C., U. S. Army, who was in charge of surgical services at the front during the World War.

Society Reorganized.—At the request of the executive secretary of the state medical society, the county secretary of Cass County Medical Society called a luncheon meeting, at which fifteen of the eighteen physicians in the county were present. It was unanimously agreed to renew the activities of the society, and the old officers were reelected for another year. At the next meeting, a fellowship reunion will be held and a constructive program mapped out.

Typhoid Outbreak.—Twelve cases of typhoid fever were reported at Battle Creek between August 12 and August 27. An investigation by the local health department showed, it is reported, that three of the cases had been "imported" and that nine had been traced to milk supplied by a certain dairy. The sale of milk from the dairy has been discontinued. Five of the cases thought to be due to milk were in children. According to the health officer, Battle Creek has not had for several years a case of typhoid fever which could be traced to a local source.

Analysis of Infant Mortality.—*Public Health* (July) published by the Michigan Department of Health, gives the causes of infant deaths in Michigan in 1924. The total number of infant deaths was 7,088, and the infant mortality rate. 72.2; 23 per cent. of them died in the first day of life; 20.5 per cent. under the first week; 14.5 per cent. under the first month, and 42 per cent. under the first year (over one month). Respiratory diseases caused 13.2 per cent. of the total number of infant deaths, digestive diseases 14 per cent., communicable diseases 7.1 per cent., natal and prenatal causes 56.7 per cent., and all other causes 9 per cent.

Meeting of Trudeau Society.—The Michigan Trudeau Society will meet at Lansing, September 28, in conjunction with the Ingham County Medical Society, and members of the adjoining county medical societies are invited to attend. Among the speakers will be Dr. Lawrason Brown, Saranac Lake, N. Y.; Drs. Robert S. Berghoff, Chicago; Herman L. Horwitz, Oak Forest, Ill.; Dr. John Phillips, Cleveland; Dr. Henry L. Taylor, St. Paul; Dr. Jacob J. Singer, St. Louis, and Professor Hallman of the Michigan State College. Dr. William H. Marshall, Flint, is president of the society; Dr. William R. Vis, Grand Rapids, vice president, and Dr. Edwin R. Van der Slice, Lansing, secretary. There will be a banquet in the evening.

Tuberculosis Conference.—The Mississippi Valley Conference on Tubercuolsis will meet at Lansing, September 29-October 1, under the presidency of Dr. Hoyt E. Dearholt, Milwaukee. Dr. Richard M. Olin, state commissioner of health, will deliver the address of welcome. Dr. William C. White, Washington, D. C., will discuss "The Results and Progress of Tuberculosis Research"; Dr. Alfred Henry, Indianapolis, "Our After-Care Responsibility"; Dr. Nathan Levitt, "Personal Experiences with an After-Care Colony"; Dr. Harry A. Pattison, Potts Memorial Hospital, New York, "Methods of Postsanatorium Supervision"; Dr. Robert E. Wodehouse, Ottawa, Canada, "European Tuberculosis Work and Ours"; Mr. Homer Folks, New York, "Tuberculosis an Economic Problem," and Mrs. T. B. Sachs, Chicago, "The Trend in Public Health Nursing." The annual banquet will be Tuesday evening, a special feature of which will be the presence of one or more of the founders of the state tuberculosis associations in each state. Dr. Linsly R. Williams, New York, will speak on "The Future of the National Tuberculosis Association." Wednesday evening will be "Play Night"; a program of entertainment has been arranged.

MINNESOTA

Personal.—Dr. John A. Evert, St. Paul, has been appointed chief surgeon of the Northern Pacific Hospital at Glendive, Mont., and will take up his new duties, October 1.——Dr. Bratrud of Warren has made a conditional gift of $5,000 to the Children's Home of Ada.——Dr. Manford O. Oppegaard, Crookston, has been elected president of the Bethesda Hospital; Dr. George A. Morley, vice president, and Dr. William H. Hollands, secretary.

Society News.—Members of the Northern Medical Association held a banquet at Breezy Point Lodge, August 24, fol-

lowing a series of clinics held during the day in Brainerd and addresses by Drs. Russell M. Wilder of the Mayo Clinic, Rochester, and John A. Evert, St. Paul.——Dr. Joseph C. Michael addressed the Hennepin County Medical Society, Minneapolis, September 9, on "Faith and Fake Cures (the Factor of Suggestion in History)."

MISSISSIPPI

Hospital News.—The Chamberlain-Rice Hospital, Natchez, has awarded contracts for the construction of a seventy-five bed hospital which is to be completed in six months.——The Natchez Charity Hospital, Natchez, announces the need of four resident physicians.

New County Health Units.—The Lamar County Board of Supervisors recently appropriated $5,000 to establish a full-time county health unit. The state will provide an equal amount, and the unit will be inaugurated, Jan. 1, 1926. Lamar is one of the smallest counties in the state.——The Attala County board of supervisors recently provided for a full-time county health department, which will begin operating, Jan. 1, 1926.

Personal.—Dr. Newman W. Nanney has been appointed county health officer of Itawamba County.——Dr. Milton W. Robertson, Rienzi, was recently appointed health officer of Alcorn County.——Dr. Clyde Ruff has been elected full-time director of the Lee County Health Department.——Dr. Robert M. Adams, Ripley, has been engaged by the board of health to lecture in connection with the Visual Education Car which was recently equipped and sent into the field by the state board of health.——Dr. William B. Dickins, Greenwood, has been appointed by the governor medical advising member of the state board of graduate nurses, vice Dr. J. H. Fox, resigned.

Vaccination Ordinance.—An ordinance passed by the board of aldermen of Natchez and approved by the mayor, became effective, August 25, provides that "no child, pupil or student shall be enrolled, enter or attend any school within the city unless such child has been successfully vaccinated against smallpox in the last five years, nor shall any child, pupil or student continue to attend any school in the city unless he shall have been successfully vaccinated within the last five years." It is further required that the child, pupil or student shall exhibit to the teacher or principal, on application for enrolment, a certificate of successful vaccination or exhibit the scar thereof, provided this shall not apply to any one who has been vaccinated without success three times within a period of five years, and no parent shall send such child to any school, public or private, or permit him to attend in violation of these provisions. The penalty attached for violation of the ordinance by any parent, guardian or person standing in loco parentis to any child shall, on conviction, be a fine of not more than $100.

MONTANA

Health Conditions.—For the first time in three years tuberculosis in Montana indicates a downward trend, according to the state health department. There were 215 deaths from tuberculosis in the first half of 1925, as compared with 250 deaths in the corresponding period of 1924; a similar condition exists for smallpox, diphtheria, scarlet fever, spotted fever, syphilis, measles, epidemic meningitis and erysipelas. There has been no death from smallpox this year, and there were three before July 1, last year. There has been a drop in the mortality from measles of 93.4 per cent., the number of deaths being sixty-nine in the first half of 1924, and four in the first half of 1925. There has been one death from epidemic meningitis, as against ten in 1924.

NEBRASKA

Change of Address.—The office of the secretary of the Nebraska State Medical Association as well as that of the business office of the *Nebraska State Medical Journal* was moved, September 1, to the McKinley Building, Lincoln.

Personal.—Dr. Roy B. Adams has been appointed school physician of the Lincoln public schools.——Dr. James W. Thomas, Nehawka, is going to Europe soon for a year of study.——Dr. H. H. Theis of Reading, Kan., has been appointed postoffice physician of Omaha.——Dr. Charles Edward Sayre, Norfolk, has been named a member of the team to go to Camp Perry, Ohio, to take part in the national rifle contest. Dr. Lincoln Riley, Wisner, is captain of the team.

NEW JERSEY

Illegal Practitioners Fined.—Dr. Robert W. Dickey, Atlantic City, and Michael Letizia, druggist, Paterson, were tried in July, it is reported, on charges of practicing medicine without a license. Judgment for penalties and costs were entered in both cases. Dr. Dickey is licensed in Ohio and Michigan but apparently not in New Jersey. Letizia is said to have applied for a new trial.

NEW YORK

Personal.—Dr. Radoje M. Taditch, director of the bacteriologic laboratory of the State Hospital at Belgrade, Jugo-Slavia, recently visited the state department of health at Albany in the course of studies at Johns Hopkins University under the auspices of the Rockefeller Foundation. Dr. Taditch will be assistant professor of hygiene on his return in the Belgrade Medical School.

Rochester University Assets.—According to the annual report of the treasurer of the University of Rochester, Rochester, the assets of that institution have increased in the last year to almost $47,000,000, and the total income of the university is about three times as great as it was two years ago. The report does not include, it is reported, gifts of more than $17,000,000 made by Mr. George Eastman.

Typhoid Outbreak.—Five cases of typhoid developed in Greenwich and Fort Edward, in July, and were traced by the local health officer to a laborer at a dairy from which all of these patients obtained milk. Sixteen years ago this patient had a "fever" lasting six weeks. It was also learned that after he was employed on another farm last year his employer developed typhoid fever. He was found to be a typhoid carrier.

Syphilitic Insane.—The State Hospital Commission has reported that 911 of the insane persons admitted to institutions for the year ending June 30, 1924, owed their insanity to syphilis, and that it has been found that the average stay in the state institutions of the syphilitic insane is one and one-half years. The cost of maintenance averages $637.50 for each syphilitic insane patient, or an estimated cost for 911 patients of $580,762.

Requests for Poliomyelitis Serum.—The state department of health requests that physicians knowing of persons who have recently recovered from poliomyelitis and who will act as donors of blood, communicate with the Division of Laboratories and Research, State Department of Health, Albany. Three patients undergoing treatment at the Reconstruction Home at Elmira and nine at the home in Ithaca volunteered, but this supply is almost exhausted. Requests are being received from various parts of the state for immune serum for the treatment of early cases.

New York City

Hospital News.—Construction work has been started on the new Long Beach Hospital, occupying most of the block bounded by Franklin and Lincoln boulevards, and Water and State streets. The site was donated by William H. Reynolds. The building itself will represent an expenditure of $100,000.

Personals.—Dr. Alfred Sordelli, director of the bacteriologic institute, National Board of Health of Argentina, is in the city studying local methods for treating contagious and infectious disease.——Sir George Lenthal Cheatle, surgeon to King's College Hospital, London, arrived in this country, August 28.

Beekman Street Hospital Free of Debt.—The statement issued, September 5, by the Beekman Street Hospital, which recently completed building additions and installed new equipment, indicates that the $350,000 campaign for funds has cleared the hospital of all debt; in the first six months of this year there was a marked increase in the demand for service, 20 per cent. more patients having been admitted than in the first six months of last year.

Scholarships for the Blind.—As a result of years of experimental work in teaching music to the blind, the Master Institute of United Arts announces several scholarships in music for the blind which will be awarded for the first time this season; a special department of music for the blind has been founded at the institute. Scholarships will be awarded only after trials to convince the directors that the applicants are worthy. Applications should be addressed to the institute before September 15.

Hadassah Medical Organization.—In a report on the Jewish health agencies in Palestine, the secretary of the Palestine Health Council said that the Hadassah Medical Organization in the last two years increased the capacity of its hospitals in Jerusalem, Haifa, Safed and Tel-Aviv from 289 in 1923 to 328 in 1924, that the patients attending the clinics increased 3,797 and the number of treatments 6,142. The Roentgen Institute in the Rothschild Hospital in Jerusalem, which was made possible by contributions from the American Jewish Physicians' Committee and the Hadassah was opened in 1924. The campaign against trachoma was extended to all the agricultural settlements and the infant welfare work extended by the opening of new stations in Tiberias, Petach, Tikwah and Rehoboth and by increasing the number of stations in Jerusalem to four. The Hadassah Medical Organization was instrumental in providing the first "health week" to be observed in Palestine. The budget of the Hadassah Medical Organization totals a half million dollars, 16 per cent. of which is contributed by the people of Palestine, 25 per cent. by the Keren Hayesod and more than 55 per cent. by Hadassah, the Women's Zionist Organization.

NORTH CAROLINA

Personal.—Dr. John L. Carroll, Asheville, has been appointed coroner of Buncombe County, vice Dr. William H. Scruggs, Jr., resigned.

Committee Meeting.—The committee recently appointed by the governor to investigate the needs of the Caswell Training School for Feeble-Minded, the particular work it will undertake in the future and to make recommendations to the next session of the general assembly, met in the governor's office in Raleigh, September 2. The committee is composed of Dr. Watson S. Rankin, Raleigh, chairman; Dr. Thurman D. Kitchin, Wake Forest; Dr. James W. Vernon, Morganton, and the following representative business men: W. C. Dowd, Charlotte; Gilbert Stephenson, Raleigh; Nathan O'Berry, Goldsboro; Henry Page, Aberdeen, and J. O. Carr, Wilmington.

Hospital News.—Following the removal of the former chief surgeon, Dr. Harris H. Bass, to Philadelphia, the stockholders of the Sarah Elizabeth Hospital, Henderson, have ordered the equipment and buildings sold; it is the purpose of the corporation to dissolve.——Plans have been made by the Watts Hospital, West Durham, to construct a seventy-five bed maternity and children's building.——Drs. William D. McLelland, George W. Taylor, Marvin A. Lackey, A. B. Sloan, Andrew E. Bell and William E. Wilson have filed papers of incorporation in Iredell County for a new hospital at Mooresville, with a capital stock of $100,000. The site of the proposed hospital, valued at $10,000, has been donated by Mr. S. A. Lawrence of that city.

OHIO

Outbreak of Septic Sore Throat.—The state department of health is investigating an outbreak of septic sore throat at Logan. Sixty-six of the seventy cases reported are said to have been on a single milk route.

Illegal Practitioner Fined.—O. C. Collins of Edison, who recently was arrested on a charge of practicing medicine without a license at Mount Gilead, and was held under bond, pleaded guilty to the charge and was fined $50, it is reported. Collins was arrested at the request of a state medical inspector.

Chiropractor Arrested.—An investigator for the state medical board caused the arrest of J. J. Bolender, a chiropractor of Urbana, August 31, it is reported, on a charge of "knowingly and wilfully announcing himself as a practitioner of medicine and surgery before he had obtained a certificate from the state medical board."

Lectures on Goiter Prevention.—Dr. John E. Monger, director of the state department of health, announced, August 25, that Dr. Oliver P. Kimball, Cleveland, had joined the staff of the state health department on a part-time basis for work in goiter prevention, and that Dr. Kimball will lecture at the state fair on that subject.

OREGON

Personal.—Dr. Allen K. Krause, Johns Hopkins University Medical School, Baltimore, gave an illustrated lecture before the City and County Medical Society at Portland, August 24, on tuberculosis.

PENNSYLVANIA

Camp for Children.—At the Mont Alto and Cresson sanatoriums for undernourished children, nearly a thousand patients from all sections of the state were given six weeks' treatment, including heliotherapy. The state department of health says that nowhere in the United States has this successful and scientific treatment been applied so vigorously and comprehensively.

Hospital News.—The Washington Hospital, Washington, has let the contract for a $700,000 building.——The new tuberculosis hospital of Lackawanna County was formally opened, July 10.——The new Veterans' Bureau Hospital for Tuberculosis at Aspinwall was completed, July 29. It has many private rooms for advanced cases and a total capacity of 250 beds, and is of modern construction and equipment in every particular.

Personal.—Dr. Robert F. Trainer and Dr. Ernest T. Williams have been elected medical inspectors of the medical schools of Williamsport.——Dr. Edward J. G. Beardsley addressed the Central Pennsylvania Medical Association, Birmingham, September 2, on practical preventive medicine.——Dr. William J. McConnell, Pittsburgh, has been added to the staff of the Philadelphia Health Council and Tuberculosis Committee as medical secretary and clinician.

Teaching the History of Medicine.—The *Pittsburgh Medical Bulletin* notes that the House of Delegates of the Pennsylvania State Medical Society, at its last meeting, passed a resolution urging the medical schools, colleges and universities affiliated with the state society in Pennsylvania to establish a professorship or lectureship for teaching the history of medicine, devoting at least one hour each week during the academic year to this subject. Cornell University, New York, recently established a chair of history of medicine, with Dr. Charles L. Dana as professor.

SOUTH DAKOTA

Physical Examinations for Boys' and Girls' Clubs.—Plans are being made to provide a physical examination for every boy and girl of the Farm Clubs who attends the state fair this year. South Dakota was the first state to give this service to its boys' and girls' clubs, according to the *Journal-Lancet*. The work, undertaken under the auspices of the state board of health and the state medical association, has met with such interest that the state college has made it a permanent part of the club program, and the state fair board is adding permanent examining rooms and providing additional space in the public health building for this feature.

TEXAS

Meeting of Sanitarians.—The third annual meeting of the Texas Association of Sanitarians will be in Waco, October 7-10, under the joint auspices of Baylor University, the state board of health and the city of Waco. Among the visiting speakers will be representatives of the American Public Health Association and the U. S. Public Health Service. Dr. A. H. Flickwir, city health officer of Houston, is the president of the association.

UTAH

Public Welfare Among Miners.—The Department of Commerce has conducted an investigation of public welfare and safety in connection with mining in Utah. It found that every mining camp in Utah has modern fireproof school buildings, many of which are among the best constructed in in the state, and that many coal mining towns are above the average in housing, water supply, sewage disposal and recreational facilities. The town of Hiawatha, for example, is said to be one of the most modern and well planned coal mining camps in the United States. It has attractive, well constructed houses, boarding houses and offices, public school buildings, teachers' dormitories and an exceptionally large and complete amusement building, in the operation of which profits derived from the motion picture theater, renting of lodge rooms, and bowling alleys are devoted to community social and welfare purposes. The Utah Copper Company has spent $800,000 since 1920 in erecting brick cottages, apartment houses and a club building in Bingham Canyon. The Gemmell Memorial Club, erected and equipped by this company at a cost of $175,000, was provided for the employees as a recreational center. Since 1920 the U. S. Bureau of Mines rescue car has trained 3,187 men in Utah in mine rescue work. There has been very little progress in the reduction

of accidents in underground work but a decided reduction in the number of accidents at the smelters and concentrators. This is partly explained by the employment of whole-time safety engineers at the smelters, who inspect all safety devices, install safeguards and train employes in safety practices. There are no such safety engineers as yet employed in the underground work.

WASHINGTON

Medical Diploma Stolen.—The attention of members of state examining boards is called to the theft of the medical diploma of Dr. George Nelson Belyea of Bellingham, which was taken from his office, August 11. The diploma was issued by McGill University, June 23, 1919.

Personal.—Dr. William M. Newman, Spokane, has been appointed county physician, to succeed Dr. Thomas C. Barnhart, resigned.——Dr. Harry V. Wurdemann, Seattle, Lieut.-Col., Officers' Reserve Corps, has been elected for the third time president of the Reserve Officers' Association for the State of Washington.

WEST VIRGINIA

Law to Restrict Prostitution and Venereal Diseases.—The Injunction and Abatement Act, passed by the 1925 legislature, declares that buildings and places used for purposes of prostitution are nuisances, authorizes suits in equity to enjoin their operation and provides penalties for the violation of any injunction that may be issued. More than forty states have passed similar acts.

Ice Cream Investigation.—The health department of Wheeling has completed an investigation of the sanitary conditions under which ice cream is manufactured in that community to determine if the requirements of the city ordinance are being fulfilled. The ordinance requires a minimum of 8 per cent. butter fat in ice cream and a bacterial count of less than 500,000 per cubic centimeter. The results of the examination of the eighteen manufacturing plants showed that all met the requirement as to butter fat. There were four plants, however, in which the ice cream examined contained from 1,130,000 bacteria per cubic centimeter to 2,500,000. The bacteria in all other ice creams ranged from 500,000 to 70,000.

WISCONSIN

Codification of Laws.—The September number of the *Wisconsin Medical Journal* contains a codification of the Wisconsin statutes covering the field of "Treating the Sick."

County Registration.—Attorney General E. Kern has ruled that a physician must register in each county in Wisconsin in which he practices. The ruling was made at the request of the state society through the secretary of the board of medical examiners, and was the result of the moving of a physician who had long been in practice. The opinion supersedes the former ruling that this registration was not necessary.

State Medical Meeting.—The president of the Wisconsin State Medical Society extends a cordial invitation to any member of the American Medical Association to be guests of the state society at its seventy-ninth annual meeting at the Auditorium, Milwaukee, September 16-18. The scientific programs begin at 9 o'clock Wednesday, September 16, at the Auditorium; the House of Delegates meets at the Pfister Hotel the preceding evening, at which place a smoker will be held Wednesday evening for the discussion of "socio-medical" problems, and at which hotel the annual banquet (informal) will be held Thursday evening. Drs. Malcolm L. Harris, Chicago, chairman of the Judicial Council of the American Medical Association, and John M. Dodson, secretary of the Bureau of Health and Public Instruction, will speak at the smoker.

Society News. — Dr. J. Gurney Taylor, Milwaukee, addressed the Chippewa County Medical Society, July 24, on "Nutritional Disturbances in the Breast-Fed Infant."——Dr. William J. Mayo, Rochester, Minn., addressed the Trempealeau-Jackson-Buffalo Medical Society, at Whitehall, August 7, on "Appendicitis," and Drs. Donald C. Balfour and Charles S. McVicar, both of the Mayo Clinic, on "Diseases of the Stomach," from the standpoint of the surgeon and internist, respectively. Dr. Hunter H. McGuire, head of the department of surgery, University of Virginia Medical School, Richmond, spoke on "Gastric and Duodenal Ulcers." Following the meeting, the society took a trip to Lake Pepin on the Mississippi River on Dr. Mayo's yacht, *North Star*.——The Marinette-Florence County Medical Society held its annual picnic, August 26, at Henes Park.

GENERAL

Accidents at Coal Mines.—Reports received by the Bureau of Mines show the loss of 166 lives in coal mine accidents in the United States in July. The fatality rate for the month was 3.45 per million tons of coal mined, which was slightly less than the rate in July of last year; 115 of the fatal accidents were in the bituminous mines of Pennsylvania. The anthracite fatality rate for the first seven months of the year was 6.21 fatalities for every million tons coal mined, while during the same months last year the rate was 5.71. There were nine major mining disasters from January to July; i. e., disasters which caused five or more deaths each. During the corresponding months last year there were only seven major disasters. The aggregate number of lives lost by accidents in coal mines in the first seven months of this year was 1,262, which is 225 less than the number reported in the same period last year.

Postgraduate Work in Vienna.—Dr. Gustav Dinolt of Vienna, Austria, writes that for purposes of organizing regular classes in postgraduate work for American physicians, there has been formed an "American Medical Association of Vienna," and that its address is Vienna IX, Spitalgasse 21, Café Klinik. Dr. Dinolt advises that persons contemplating study in Vienna should write to the secretary of this association for information regarding the courses; he should state the kind of work desired, when he will be present and when to book his course. The classes for 1926 have not yet been fixed. Each course is limited to about eight to ten students; advance information is therefore essential. The courses are nearly all in English, some in German only; they cost from $8.00 to $20.00 per month, according to the number of hours. There are plenty of places where one can live for about $2.00 per day per adult.

Bequests and Donations.—The following bequests and donations have been announced recently:

The Harrisburg Hospital, Harrisburg, Pa., $5,000, and the Chester County Hospital, West Chester, Pa., $2,500, by the will of the late Emily R. Marple; the residue, after several other bequests, to the Harrisburg, Pa., and the Garrettson Hospital, Philadelphia, for free beds.

The Methodist Hospital, Indianapolis, $20,445, by the will of Anna Delzell Hughes.

The Children's Memorial Hospital, Chicago, $100,000, by the will of the late Victor F. Lawson.

Winnipeg Hospital, Winnipeg, Manit., £1,000, by the will of the late Surgeon Lieutenant-Colonel Melladew of the Royal Horse Guards.

The Burlington Hospital, Mercy Hospital and St. Francis Hospital, all of Burlington, Iowa, $5,000 each, by the will of the late E. P. Eastman.

The Roosevelt Hospital, Methodist Hospital, Rush Hospital and the Children's Homeopathic Hospital, Philadelphia, $1,000 each, by the will of the late Charles Lockhart.

The Women's Homeopathic Hospital, Philadelphia, $1,000, by the will of the late Madeline K. Vandergrift.

The Presbyterian Hospital, New York, $5,000 each from Miss Ruth Draper and Robert W. Bliss and wife, and $6,000 for a one-bed room from the Imperial Lodge of Elks.

The White Cross Hospital, Columbus, Ohio, $3,033, by the will of the late Joseph L. Dickey.

The Torrance Hospital Association, Torrance, Calif., $500 each from Dr. Jesse S. Lancaster, Torrance, and John S. Cravens, Pasadena, Calif.

The Jefferson Hospital, Philadelphia, $50,000 for the establishment of a private room and $15,000 for the establishment of three beds, by the will of the late Simon Gratz.

LATIN AMERICA

Tribute to Moreira.—The eighty-fourth anniversary of the organized care of the insane in Brazil was celebrated with a tribute to the director, Prof. Juliano Moreira. A bronze bust was unveiled, and an endowment fund in his name and the foundation of the Moreira prize were announced. The Guinle pavilion, dedicated to treatment of neurosyphilis, was inaugurated by the faculty of medicine as part of the festivities.

Personal.—Drs. Strode and Davis have arrived in Buenos Aires as commissioned by the Rockefeller Foundation to aid in the organized fight against malaria and hookworm. They have been doing similar work in Paraguay and Brazil.——Prof. Pinto de Carvalho was the guest of honor at a banquet tendered by the medical profession of Bahia and other friends recently.——A number of physicians in Brazil recently sent a greeting engraved on parchment to the retiring professor of neurology at Paris, Dr. Pierre Marie, expressing their appreciation of his scientific work.——Dr. Carlos Chagas was recently installed in the newly founded chair of tropical medicine at the University of Rio de Janeiro.

FOREIGN

Esperanto Congress at Geneva.—Dr. Dlassberg, Cracow, was elected president of the medical section of this recent conference, and Professor Vanverts, Lille, was appointed editor-in-chief of the *Esperanto Medical Journal,* which it is planned to enlarge.

Physicians of Ministry of Health.—Whereas in England, in 1914, thirty-four physicians were employed "to safeguard the nation's health" under the old local government board, the ministry of health now employs ninety-two, and the funds estimated necessary for the medical staff of the ministry for the present financial year amount to £182,910 whereas the medical staff of the local government board in 1919 cost only £35.743. The treasury is attempting to reduce the cost of the ministry of health.

Prize for Evidence Extolling Experimental Method in Science.—The Bufalini Prize of 6,000 lire is offered for the best work presented on the subject of the necessity of the experimental method in study of all the sciences—as opposed to a speculative and dogmatic philosophy—with a review of what this method has contributed to special sciences during the twenty years since the last awarding of the prize. The competing articles must be in Italian or Latin, with the name in a sealed envelop, and be received before July 30, 1926, addressed to the Segreteria della R. Universita, Piazza S. Marco, Florence.

Medical Statisticians.—A luncheon was given in August by the British government in honor of the foreign public medical statisticians who were visiting England under the auspices of the League of Nations. Among those present were Sir Humphry Rolleston, Sir Arthur Newsholme and Dr. Thomas H. C. Stevenson, C.B.E; Sir Kingsley Wood presided. The foreign guests included Dr. S. Rosenfield, Austria; Dr. Camille Jacquart, Belgium; Dr. H. J. Hansen, Denmark; Dr. Martti Kovero, Finland; Dr. M. Huber, France; Dr. E. Roesle, Germany; Dr. Cunnar Jahn, Norway; Dr. James C. Dunlop, Scotland; Dr. E. H. N. Arosenius, Sweden; Dr. Marcel Ney, Switzerland; Dr. W. H. Davis, United States; Dr. A. Aguirre-Sayago, Chile; Dr. Martin Kacprzak, Poland; Mr. K. Stouman and Mr. J. Pagnod, League of Nations.

Hospital Needs of England.—A commission directed by the minister of health in April, 1924, to inquire into and report on the amount of additional hospital accommodation required in England and Wales, has presented its report. The commission considers, says the *British Medical Journal,* that about 10,000 additional hospital beds are required in England and Wales and that to provide them there should be a grant by the treasury of £2,000,000, about half the cost of the beds; the other half should be provided from local sources. The commission said little about the future maintenance of the voluntary hospitals. It regards the system of local boards as centers for cooperation in the activities of voluntary hospitals a wise measure but that in the reconstitution of the local boards the direct representatives of the hospitals should not be in a majority. The experience of the commission in administering the recent grant of £500,000 shows that the voluntary hospitals are solvent, with exceptions, and able to raise the funds to maintain 10,000 new beds. They have, however, no reserve for new capital expenditures.

South African Medical Congress.—The twentieth South African Medical Congress was held at Pietermaritzburg, July 6-11, under the presidency of Dr. D. Campbell Watt of that city and with the Natal Island Branch of the British Medical Association acting as hosts. The congress was officially opened by Sir John Dove-Wilson of the Supreme Court with the mayor of Pietermaritzburg in the chair. A new feature of the congress was a popular medical lecture delivered in the town hall by Dr. Shadick Higgins, health officer of Cape Town, on "Public Health in Relation to Social Welfare." Among the subjects discussed in the scientific sections were "The Etiology of Influenza"; "Calcium Therapy"; "Diagnosis and Treatment of High Blood Pressure"; "The Results of a Series of Cases of Suprapubic Prostatectomy"; "Leprosy"; "The Work of the Laboratory in Relation to the Practice of Medicine"; "Bailliart's Instruments Used for the Estimation of the Elasticity of the Small Arteries," and "Cesarean Section for Placenta Praevia." There was golf, tennis, bowling, croquet and boating. In the opinion of the *South African Medical Record,* the congress was a success.

Personal.—Dr. Aldo Castellani, director of tropical medicine and dermatology, Ross Institute, London, has been elected a corresponding member of the Royal Academy of Medicine of Belgium. Recently Dr. Castellani was elected a corresponding member of the Société française de dermatologie.——Sir Ronald Ross formally opened the new building of the British Mosquito Control Institute at Hayling Island, August 31.——The Graefe prize has been awarded this year by the German Ophthalmologic Society to Dr. E. Seidel, chief of the university eye clinic at Heidelberg, for experimental research on glaucoma and the interchanges of fluids in the eye.——Prof. G. Ceccarelli, Perugia, is the recipient this year of the Zannetti prize, given by the Florence Academy of Sciences, for his works on skin grafting.——A gold medal was recently presented by his friends and pupils to Prof. R. Colella, of the chair of nervous and mental diseases at Palermo. He has recently published a compilation of the works that have issued from his service. It is a volume of 1,000 pages.——Dr. J. Goyanes Capdevila, president of the Spanish Anticancer League, has been commissioned by the government to visit the cancer institutes of France, Belgium, Germany, the Netherlands, Denmark, Sweden and Norway. ——Dr. Bailey is the representative of the Rockefeller Foundation in the international party of internists sent to Spain by the health board of the League of Nations to study ways and means to combat malaria in that country. They were particularly interested in the endemic malaria encountered at the comparatively high altitude of the Escorial district.——Our European exchanges mention the arrival at different points and the festivities greeting the large party of Spanish physicians now making a tour of the medical centers of western continental Europe.

Deaths in Other Countries

Dr. **Walter Carless Swayne,** professor of obstetrics in the University of Bristol, was shot and killed, August 8, at Sellack, aged 63.

Government Services

Army Personals

Major John E. Walker has been ordered from Hot Springs, Ark., to Walter Reed General Hospital, Washington, D. C., for duty.——Major William A. Foertmeyer, Letterman General Hospital, Presidio of San Francisco, has been directed to report to the Army Retiring Board for examination.——Captain Charles W. Henderson, Letterman General Hospital, San Francisco, will proceed to Camp Stephen D. Little, Nogales, Ariz., for duty about September 1.——Major Edgar A. Bocock has been directed to proceed from the Walter Reed General Hospital, Washington, D. C., to Camp Holabird, Md., for duty, November 1; Major Jirah M. Downs from the Letterman General Hospital, San Francisco, to Nogales, Ariz., for duty, September 1; and Capt. John F. Lieberman from the Walter Reed General Hospital to Fort Bragg, N. C., September 15, for duty.——Col. Alexander N. Stark, Medical Corps, has been retired from active service on account of disability incident thereto.——On completion of foreign service in the Panama Canal department, Major Albert G. Franklin will be assigned to duty at Fort Sam Houston, Texas; Capts. James R. Bibighaus to the Presidio of Monterey, Calif.; William T. Fisher to Camp Devens, Mass., and William S. Crawford to Walter Reed General Hospital, Washington, D. C.——The following officers will sail from New York, Jan. 21, 1926, for duty in the Canal Zone: Major Elvin H. Burger, Fort Sam Houston, Texas; Capts. Ross B. Bretz, Washington; Wilmer C. Dreibelbies, Port Leavenworth, Kan., and Brooke Dodson, Fort Niagara, N. Y.

Veterans' Bureau Personals

Dr. Charles M. Griffith, chief, Hospital Section General Medical and Surgical Division, at the central office of the Veterans' Bureau, Washington, D. C., and Dr. Leon M. Wilbor, chief, Hospital Section Neuropsychiatric Division, have been assigned to "field duty" as medical supervisors for a period of two to three months.——Dr. Walter D. Martin of the Inspection Division of the central office of the Veterans' Bureau, resigned July 1.——Dr. Hugh L. Robinson, on duty at Hospital No. 44, West Roxbury, Mass., resigned, June 15. ——Dr. Ralph E. Runkle, on duty at Hospital No. 80, Fort Lyon, Colo., resigned, July 8.——Dr. George B. Story, on duty at Hospital No. 99, Excelsior Springs, Mo., resigned, August 7.——Dr. Howard T. Child, on duty at Hospital No. 95, Northampton, Mass., resigned, July 20.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 29, 1925.

The British Social Hygiene Council

The first annual meeting of the British Social Hygiene Council has been held. The council, under its new name, replaces, after eleven years of valuable work, the National Council for Combating Venereal Diseases. An important extension of the work will take place without any relaxation of the past work in respect of public enlightenment on the problems of venereal disease and facilities for their free treatment. During these eleven years it has been a main part of the work of the national council to promote the policy and the work of the ministry of health and of public health authorities in securing diagnosis and treatment for all patients, as a means for diminishing infection and avoiding consequences associated with these diseases. The wide distribution of information concerning these diseases which it has been able to furnish has been an important factor in the medical success that has been achieved. The success is shown by the fact that during the last four years the number of new cases of syphilis at the treatment centers has declined by nearly 50 per cent. Great progress has been made since the formation of the purely voluntary organization of the National Council for Combating Venereal Diseases in 1914. Today the organization of the British Social Hygiene Council spreads to all corners of the empire. It is recognized by and cooperates with government departments—the ministry of health, the colonial office, the admiralty, and the air ministry—in providing material for popular enlightenment and in cooperation in all measures calculated to reduce the ravages of venereal disease, receiving grants for certain specific activities. At home, active cooperation exists between almost all the local authorities in the country and the council; and out of the 154 areas the council has recognized branches in eighty-five, creating centers for the formation of public opinion and for building up protective and preventive machinery in the interests of youth. Councils have been established in Canada, South Africa, Australia and six of the crown colonies, and a close liaison exists between the council and colonial health departments throughout the empire.

The British Social Hygiene Council is now extending its attack on venereal disease on social as well as medical lines, and is working for the reduction of promiscuity. To insure success, increased prominence is being given to the elimination of those conditions of life which tend to foster promiscuous intercourse and the spread of disease. With the object of preventing infection, the British Social Hygiene Council is extending its work to include the fostering of character training of the young. It advocates basing habit formation on a knowledge of the facts of life and on the attainment of right conduct through consciousness of social and racial responsibility. The council also is working for the eradication of all known forms of commercialized vice and the promotion of adequate facilities for recreation and diversion.

The Bureau of Entomology

The report of the second imperial entomologic conference held recently in London has been issued. It recommends that in suitable circumstances interdominion and intercolonial meetings of entomologists, mycologists and other scientific officers should be arranged. It is already in contemplation to invite the governments of South, Central and Eastern Africa to send their expert officers to some convenient central point in order to discuss methods of control of cotton pests. The bureau may be described as a clearing house, through which may be made known to all those engaged on entomology the results of work which is being carried out in other parts of the world, and, further, as a central institution to which entomologists may send insects for identification, and to which they can look for advice and assistance in dealing with their problems. If, as is possible, the time has now come when financial conditions will permit of a comprehensive attack on the tsetse fly, the bureau will be glad to give any assistance in its power and to lay at the disposal of the authorities the knowledge already gained in experimental work in Tanganyika Territory, Nigeria and Uganda.

Antisuicide Bureau

Brigadier Chapman, who has been associated with the antisuicide bureau of the Salvation Army since its inception in 1908, has just relinquished the position. So useful has been the work that there is now a standing order in each metropolitan police station empowering the officer in charge to hand over certain classes of would-be suicides to the Salvation Army, thus obviating police court proceedings. The idea of General Booth, when he founded the bureau, was that no man would commit suicide so long as he thought he had one friend in the world to stand by him. The bureau was intended to be a friend of the hopeless, and it has been helpful to thousands of distraught men and women. All sorts and conditions of people come within the purview of the bureau. How the bureau works may be gained from the following instances: A city merchant, worried about his financial affairs, which had become involved, attempted suicide on the railway, and got into the hands of the police. The magistrate before whom he appeared did not want to send him to prison, and communicated with the Salvation Army. At first the man refused to have anything to do with it, but ultimately consented to place himself unreservedly in its hands. Brigadier Chapman was given power of attorney, and when the man retired into the country to recuperate, his business was carried on in his absence. On his return he found that his financial position was perfectly secure

Improved Financial Position of the London Hospitals

A statistical report for the year 1924 on 118 London hospitals issued by the King Edward's Hospital Fund for London shows: (*a*) A continued increase in the work of the London hospitals, the total available beds being 13,460 in 1924, an increase of 350 over 1923 and 1,620 over 1913. This is especially interesting in view of the report recently issued by the Voluntary Hospitals Commission on the question of extension. (*b*) A continued increase in maintenance expenditure, the total being $13,780,000 in 1924, as against $13,165,000 in 1923 and $6,820,000 in 1913. (*c*) A continued increase in income, which was $14,590,000 in 1924, as against $14,300,000 in 1923 and $7,425,000 in 1913. (*d*) A remarkable improvement in the financial position since the crisis in 1920, whereby the net aggregate deficits (taking all the hospitals together) for the years 1920, 1921 and 1922 have been gradually changed into net aggregate surpluses for 1923 and 1924, and the number of hospitals with deficits has decreased from seventy-seven in 1920 to fifty-four in 1924. (*e*) In addition to the increase in income, very large sums received for capital purposes during the last three years; viz., for endowment $3,225,000 and for buildings and equipment $4,050,000. Among other points of interest is the proportion of expenditure covered by each kind of income: 20.1 per cent. by income from investments, amounting to $2,770,000; 37.7 per cent. by voluntary gifts, amounting to $5,195,000; 29.8 per cent. by patients' payments and other earnings, amounting to $4,100,000, and

18.3 per cent., or $2,525,000, by legacies and other extraordinary income; the surplus of income over expenditure being 5.9.

British Ophthalmologists' and "Opticians'" Claims to Prescribe Spectacles

In connection with ophthalmic benefit under the national health insurance act the royal commission is holding an inquiry. The council of British ophthalmologists strongly opposes the qualified opticians' claim to prescribe spectacles, holding that the examination of the eyes should be carried out by qualified physicians. It approves and supports the recommendations in this respect recently formulated by its subcommittee in conjunction with representatives of the British Medical Association. Asked by the chairman of the commission whether the general practitioner would be acting improperly in advising a patient to go direct to an optician, Mr. Collins, giving evidence on behalf of the ophthalmologists, said that that must be left in a large measure to the general practitioner himself. If he accepted the responsibility of stating that the case was one which required only the care of an optician, he would be taking on himself a very large responsibility. An optician might in some cases be capable of ascertaining the figures representing an optical defect, but the determining of the glasses that should be worn was quite another matter, and one that required medical as distinct from optical training. Asked whether he considered that there were sufficient medical practitioners versed in ophthalmic work to meet the requirements should this benefit be extended to the whole insured population, Mr. Collins said that his council had associated itself with the British Medical Association and the Ophthalmic Benefit Committee in this matter. The British Medical Association had drawn up a list of some 500 ophthalmologists prepared to see insured persons at a uniform fee of $5 on behalf of approved societies. The supply would also tend to increase with the demand. Asked what evidence there was of real danger that had arisen in consequence of the very common practice of going straight to an optician, Mr. Collins replied that his council had plenty of evidence which could be divided under three heads: overlooked disease, patients unnecessarily alarmed about their condition, and unnecessary glasses supplied.

Irish Physicians and the British Medical Register

The difficulty that has arisen in consequence of the Irish Free State deciding to establish a medical register of its own has been described in a previous letter (THE JOURNAL, September 5, p. 759). Mr. Cosgrave, president of the Free State executive council, in a speech defending this policy said that in 1858 the British medical council was constituted and at the same time branch councils were set up for England, Scotland and Ireland. The work of medical registration was carried out by these branch councils subject to general control by the British medical council. The medical council set up in 1858 was a United Kingdom body constituted on the basis of the unity of Great Britain and Ireland. That unity was dissolved on the setting up of the Free State as a self-governing dominion. The system of medical registration in existence then became no longer applicable to Ireland. It was impossible to exaggerate the importance of the medical profession to a country. Consequently it was incumbent on the government to control the profession within its borders. With regard to the ill effects feared from the government's proposal, he pointed out that the medical register at present had a colonial list of physicians with the same rights of practicing and entering the imperial services as physicians on the British medical register. He could see no force in the argument that Irish physicians in future could not practice in England.

The only medical support received for the government's proposals comes from the medical faculty of University College, Galway, which has issued a statement that "the time has come when an Irish nation must control its own affairs, and this applies to medicine as to other matters. The hardships which will accrue to Irish graduates have been unduly stressed." At a special meeting of the Royal College of Surgeons in Ireland a resolution was passed unanimously approving of the conduct of the president, Mr. R. C. B. Maunsell, in opposing the proposal to establish a separate medical register. But the council decided that, as the medical profession never interfered in politics, it would combat the government's proposal by the education of public opinion alone, and would undertake no political campaign.

In a letter to the president of the college, Mr. Gogarty, a throat specialist and member of the Irish senate declares: "The effort to get rid of the general medical council arises from the same idea which instigates the spending of immense wealth in forcing both children and teachers in the infant schools, when all our rivals in the English market are learning English, to use a new-fangled form of Gaelic, incomprehensible to native speakers, as the only form of education. The intention is to turn the Galway College into a Gaelic-speaking licensing body. Evidently before this can be accomplished it is necessary to become separate from the British medical council, which has a high and international standard. At the present moment the worst physiques and sanitation are to be found in the Gaelic-speaking districts."

PARIS

(From Our Regular Correspondent)

Aug. 21, 1925.

Treatment of Tuberculosis with the G. Dreyer Antigen

In May, 1923, G. Dreyer announced in a somewhat startling article that with the aid of a defatted tuberculous antigen he had been able to arrest in guinea-pigs the evolution of tuberculosis. It was with some surprise that the medical public learned, on reading the details of the announcement, that Dreyer's observations were confined to four guinea-pigs, which was a rather modest showing in view of the results claimed. In an attempt to confirm Dreyer's results, E. Grasset carried out experiments on a large number of animals in the laboratory of Professor Calmette at the Pasteur Institute. As is well known, the Dreyer antigen is obtained by treating with solution of formaldehyd tubercle bacilli, which are afterward defatted by acetone. After this treatment, the bacilli are no longer acid-resistant, and when emulsified in a 0.9 per cent. solution of sodium chlorid are injected under the skin of tuberculous guinea-pigs.

According to Dreyer's account of his experiments, the emulsions of bacilli thus defatted and treated with formaldehyd produced no abscesses at the site of the injection, nor did the animals treated succumb to the tuberculous infection. From the beginning of his researches, Grasset found that not only was it inaccurate to speak of "absence of local reaction"; for a puffy condition of the tissues at the point of injection developed, but also adenopathies appeared, which were more marked near the site of the injections of antigen. The remote results were likewise negative. The treated animals all died after the lapse of the same periods as the controls; they even became more rapidly emaciated than the controls.

Angina Pectoris

At the eighteenth French Congress of Medicine, the subject of angina pectoris was presented in two excellent papers by Gallavardin and by Richon. Gallavardin first discussed the present hypotheses, which ascribe an important rôle to the cervical region of the spinal cord. He then took up the types

of angina pectoris of grave import. Among these he distinguished *angor d'effort*, of which he cited 486 cases; *angor de repos*, which is more rare, and, finally, angor in the various cardiac or mediastinal affections. Passing in review the types of angina pectoris of uncertain import, the author pointed out their variety and the frequently unfrank character of the paroxysm. He emphasized also the difficulty of the diagnosis and the prognosis.

In studying the benign types of angina pectoris, it became evident that he was a follower of Laubry, who ascribes them to the hyperexcitability of the cardiac nervous system, whereas organic angor results from a hyperexcitation. The cause that is responsible for this hypersensibility lies sometimes in a distant part of the organism (liver, testis, amputation stump, gastric distention).

Discussing the pathogenesis of angina pectoris, Gallavardin pointed out that, while it is true that there are numerous cases in which at necropsy no obliteration or contraction of the coronary arteries has been found, it is nevertheless true that in twenty necropsies of genuine cases of angina pectoris he found an obliteration of the coronary arteries in ten instances.

Richon gave a brilliant discussion of the present status of surgical treatment of angina pectoris. He recalled that François Franck was the first to propose the resection of the cervical portion of the sympathetic trunk, and enumerated the various possible interventions: operations on the spinal nerves beyond the rami, which have not given good results; operations on the depressor nerve and on the trunk of the vagus nerve, and operations on the sympathetic system (more or less extended resection of the cervical portion of the sympathetic trunk).

Richon, in closing, spoke more encouragingly of these operations, saying that they would yield better and more permanent results when with wider experience the technic had been worked out more precisely.

The Epidemiology of Cancer

In two noteworthy articles, L. Negre has taken up again the question of cancerous regions and cancer dwellings. After making investigations at Labastide in the Tarn region, where cancer is very frequent, causing 15 per cent. of the deaths, he points out that in that town cancer appears to have been especially frequent in certain sections. But the sections that have, in the past, been most affected have, for a number of years, been unusually free from cancer. The endemia seems to have shifted, and Negre noted similar conditions with respect to so-called "cancer houses." He states that these observations are difficult to explain if we accept the parasitic origin of the affection.

On investigating the houses of Labastide in which as yet not a single case of cancer has occurred, the author found that, for the most part, these were houses of recent construction. On the contrary, the houses in which cases of cancer have been numerous are among the oldest in town. In many instances the back of the house is near a high hill, with the result that the lower floor is particularly damp. Rats are numerous and Negre raises the question whether the rat might not carry an infective agent such as *Gongyloncma*, a nematode parasite, which would produce carcinoma of the stomach in the rat. While not ready to accept the conclusions of Dr. Sambon, who holds that the aforementioned parasite plays a part in the genesis of cancer in man, the author has studied various statistics and points out the extraordinary frequency of cancer of the digestive tract. It is well known that *Gongyloncma* passes its larval stage not only in the cockroach but also in certain parasites found in flour (Fénébrionides and Scarabéides). Negre studied the distribution of cancer near bakeries and found (1) a large number of cancer cases in the vicinity of bakeries, and (2) frequency of cancer in bakers and in bakers' families, and, as a curious fact, a high frequency of cancer of the digestive tract. While Negre would not draw from the results of his investigations any exaggerated conclusions, he wishes that more extensive researches might be made in this direction, as they might throw new light on the controversial question of the epidemiology of cancer.

Fixation Reaction in Chancroidal Infection

Pierre Teissier, J. Reilly and Rivalier presented at the eighteenth French Congress of Medicine the results of their researches on the existence of an amboceptor in the blood serum of chancroid patients. As antigen they used endotoxin extracted from Ducrey bacilli. The authors showed that, in 94 per cent. of the cases, a deviation of complement was secured which appeared the eighth day and may persist three years after recovery. They observed increase of the antibodies on injecting into the patients killed micro-organisms, whereas the injection of the same organisms in healthy persons did not cause the formation of antibodies. The deviation of complement appears to be an entirely specific reaction and is not wanting except in subjects that do not present the usual inguinal adenopathy.

VIENNA

(From Our Regular Correspondent)

Aug. 14, 1925.

Report of the Institute for the Prophylactic Treatment of Rabies, 1913-1923

Vienna has its own institute for treatment of persons bitten by animals, in whom rabies may develop. The institute is under state supervision and is connected with the Rudolf Hospital. A recent report covering the eleven year period from 1913 to 1923 distinguishes between the prewar period, the period of the war, and the postbellum period, since the territory from which it drew patients has varied under changing conditions. In 1913 and 1914, 1,434 persons were inoculated; however, sixty-six of these can be eliminated because they did not complete the treatment or because the animal that did the biting proved not to have rabies. Of the 1,368 remaining, 64 per cent. were men and 36 per cent., women; or, with respect to age, 62 per cent. were adults and 38 per cent., children. In 32 per cent. of the cases, a week elapsed before treatment was begun. In 94 per cent., the animals that did the biting were dogs, of which 88 per cent. had rabies. Five per cent. of the animals concerned were cats. In nine instances, horses, in two cases, cattle and in five cases, human beings did the biting. Of the persons inoculated, sixteen died—six succumbing during inoculation or within fourteen days after the conclusion of treatment. The shortest period of incubation was sixteen days; the longest, twenty-six days. Severe head and face injuries predominated. In the ten other fatal cases, the patients developed the infection between the thirty-second and the one hundred and twenty-seventh day after the injury. Among these were four bite injuries that were slight. During the same period, six persons that were not inoculated died from rabies. Of the sixteen inoculated patients who died, ten were children, or 62 per cent., whereas only 38 per cent. of the persons bitten were children. In general, children succumb more readily to rabies than adults; for example, the mortality for adults bitten about the head was 1.92 per cent., while the mortality of children was ten times as high; namely, 19.45 per cent.

During the war years (1915, 1916, 1917 and 1918), 5,153 persons were inoculated in the institute, but only 4,850 cases are utilizable for statistical purposes. During this period, there seems to have been a certain laxness in examination by veterinarians of the biting animals; then, too, many patients came from regions in which veterinary sanitation and examinations were of doubtful efficacy. Therefore, the mortality statistics of patients who returned home are not reliable. There were 63 per cent. men and 37 per cent. women; among these, 33 per cent. children. Nine hundred and eighty-nine patients did not

receive treatment until more than a week had elapsed after injury. The patients came mainly from the following countries: Bessarabia, five cases; Russian Poland, ninety-nine; Ukraine, three; Roumania, sixteen; Serbia, four; Bulgaria, seven; Albania, fifteen; Croatia, twelve; Bosnia, fourteen; northern Italy, 166—from war-stricken areas, it will be seen, in which the hygienic arrangements were, for the most part, very defective. The biting animals were: 92.75 per cent. dogs, 6.5 per cent. cats; in addition, six horses, sixteen bovines, one pig, one fox, one ass, one ape. In fourteen cases human beings did the biting. In 33 per cent. of the cases it was not absolutely certain that the animals were actually suffering from rabies, but it was probable. Of those inoculated, sixty-one died from rabies; thirteen of these during treatment or, at the most, within fourteen days after completion of treatment. The shortest period of incubation was fifteen days; the longest, thirty-two days. Of the thirteen cases, seven were severe head-and-face bites, five severe hand bites, and one mild foot bite. Five of those who died were bitten by dogs that were supposed to be affected with rabies, though the infection had not been demonstrated by laboratory experiments. The remaining forty-eight patients who died gave evidence of the infection after an incubation period of from thirty-five to 169 days. In six cases, incubation extended over a period of 100 days or more (four hand wounds, and one arm and one foot wound), all of them severe cases. During this period, three patients died from postvaccinal paralysis, one from sepsis of the bite wound, and one from pneumonia. In these five cases, neither the clinical course nor the necropsy could justify the diagnosis "rabies." During the period, twenty-six who were bitten and were not inoculated died from rabies. The mortality of children was high here as well, particularly in case of head wounds. Of 168 children of this class, sixteen, or 9.5 per cent., died, whereas of 141 adults with head wounds, only five, or 3.5 per cent., died.

In the years following the war (1919-1921) the number of persons applying for assistance has decreased, partly owing to the dismemberment of the empire. In these three years, only 1,217 persons have visited the institution, only 1,119 of whom could be considered for the purposes of statistics. The men constituted 60.5 per cent.; women, 39.5 per cent.; 34 per cent. of the patients being children. Thirteen per cent. of the patients presented themselves too late for inoculation. The biting animals were: dogs, 92 per cent.; cats, 5 per cent.; in addition, ten horses, eight bovines, six pigs, one goat, one rabbit and six human beings are incriminated in the register. In 79 per cent. of all cases rabies was demonstrated in the animals, including the goat and rabbit. Fourteen persons died, in spite of inoculation, during this period; seven of whom died during treatment (incubation from fifteen to twenty-seven days), without exception, all severe head and face wounds. The remaining seven patients developed infection and died a long time after injury, the incubation time ranging from forty-three to 278 days. During this period, eleven persons who were not inoculated died from rabies. In all the statistics the high mortality of head wounds may be noted, which in some years reached 27 per cent. This proves that methods need to be further improved. The Pasteur method brings about immunity of the organism only when fourteen days have elapsed after inoculation, and patients with a short incubation period cannot be saved by inoculation. Better methods, are, therefore, being sought.

In December, 1921, Professor Paltauf, after comprehensive experiments on animals, introduced in the Vienna institute the "ether method" (recommended by Alivisatos and by Remlinger) in combination with the Pasteur and Högyes procedure, and since then that method has been employed in all severe wounds. During 1922 and 1923, improvement in the results of inoculation was apparent. Although rabies, during this two-year period, has shown an increase in Austria and the number of persons inoculated has been correspondingly greater, the fatal cases have been fewer. More than 12 per cent. were tardy in seeking treatment. The biting animals were: dogs, 90 per cent.; cats, 7 per cent.; in addition, fifteen bovines, seven horses, six pigs, one fox, and three human beings were incriminated. Three patients (two children and an adult) died, after an incubation period of from thirty-three to fifty-two days. Furthermore, five inoculated persons died from postvaccinal paralysis, rabies not having been demonstrated, and nine bitten but not inoculated died from rabies. The new method thus gives much more favorable results than the old Pasteur method. Whereas up to and including 1921, the yearly mortality of all persons inoculated fluctuated around 1.2 per cent., the corresponding mortality for 1922 and 1923 dropped to 0.19 per cent., or less than one sixth of the former rate, though the character of the bites and the severity of the injuries average much the same each year. During the eleven years covered by the report, the head wounds ranged from 5 to 7 per cent. of the total, the hand wounds from 44 to 53 per cent., the arm wounds from 10 to 14 per cent., wounds of the lower extremities from 25 to 32 per cent., and wounds of the trunk from 1 to 4 per cent. During the last two years, a number of exceedingly severe head wounds have been observed, which, judging from previous experience, would have yielded a number of deaths from rabies, but not one of these cases has resulted fatally. In the three patients who died from a hand, a foot and a head wound, respectively, the new method was just beginning to be used and experimental trials were being made with ether injections. The deaths from myelitis occurred in cases in which ether injections were not employed. The increase of such complications was beginning to attract attention, but since September, 1923, when the old Pasteur method was abandoned and the Högyes method instituted, these complications have disappeared. Dr. J. Schweinburg, the author of the cited report, promises a further communication on myelitis, which will doubtless be instructive.

Birthday Honors for Two Professors

Two esteemed professors of the University of Vienna have reached important stages in their careers; Prof. Dr. S. Klein, the Nestor of Vienna ophthalmologists, attained the age of 80 and Professor Ortner reached the age of 60. Klein was an assistant of the pioneer of ophthalmology, Professor von Jaeger, and learned from him the use of the ophthalmoscope; particularly the method of examination by the direct method. He has published several textbooks on ophthalmology, including a work on examinations of the fundus oculi in mental cases. He has also collaborated in the publication of collective works, such as Nothnagel's Handbook and Eulenburg's "Realencyclopädie der Gesammten Augenheilkunde." His didactive ability and great skill as an operator attracted many pupils to the Vienna policlinic. He emphasized the importance of balneology in the treatment of diseases of the eye.

Professor Ortner is the head of the second clinic for internal diseases in Vienna. As the assistant and pupil of Neusser, he became well known as early as 1894 through his researches on infections of the bile ducts and on pericarditis in peritonitis. In 1907 he was called to Innsbruck as director of the clinic, but in 1911 he returned to Vienna, where he became director of the clinic of internal diseases, in which he is still active. His "Diagnosis of Internal Diseases" and his "Symptomatology" are outstanding textbooks, which have been translated into all civilized languages. The older he becomes, the more fruitful and the more intense are his activities. The completion of his sixtieth year was made the occasion of a great celebration.

BERLIN

(From Our Regular Correspondent)

Aug. 22, 1925.

Results of the Recent Census of Germany

According to preliminary reports of the census taken June 16, Germany has now a population of 62,500,000. The war and the subsequent cessions of territory as stipulated by the Versailles treaty had reduced the population from 67,900,000 in 1915 to 59,200,000 in 1919. The latter figure does not include the 400,000 war veterans who had not yet returned to their homes. The increase in population since 1919 of nearly three millions is due to various causes, chief among which is the excess of births over deaths—0.85 per cent. This would constitute an increase of about 2,500,000. However, the excess of births over deaths is not due to an increase in the birth rate. As a consequence of the exceedingly high birth rates that prevailed in the ninth and tenth decades of the last century, the number of persons belonging to the 20 to 40 age group is very high, comparatively, and consequently the mortality rate is much below normal.

The further increase of about 400,000 may be explained by reemigration from the colonies and the ceded territories. Corresponding to this increase in population, the density of the population has increased. There are now 132.9 persons to the square kilometer; in 1910, the density was only 122.9.

With reference to sex incidence, not only has the growing preponderance of females been checked but the males have begun to regain their rightful proportion. In 1910, there were 1,029 female inhabitants to each 1,000 males, and in 1919, as a consequence of the war, the female portion of the population had so gained the upper hand that there were 1,101 females to 1,000 males. The census shows that there are now only 1,074 females to 1,000 males. This gain of the male portion of the population is due in the main to the preponderance of male births in recent years, but it will probably be some time before the gaps that were caused by the death of two million men in the prime of life will have been closed.

As regards geographic distribution of the population, the number of "chief cities" (more than 100,000 population) has increased by three. Two of these are commercial and manufacturing cities (Oberhausen and Ludwigshafen), and their increase in population during the last fifteen years is due to the growth of the large industries. The third new "chief city" is Wiesbaden, which, as a result of the war and the occupation by foreign troops at the time of the 1919 census, had lost this distinction. Nearly all the chief cities show a gain over 1919, and all but seven have gone beyond the population of 1910. Kiel is an exception, as its present status is about 9 per cent. below the prewar population; it is the only "chief city" that shows a falling off since 1919. As for the share that the various states or provinces have had in the increase in population, the largest share falls to Prussia (it being by far the largest state) which shows an increase of 3,140,000 since 1910, although the highest percentage of increase was recorded by Oldenburg (14.1). The smallest increase was registered by Schaumburg-Lippe (2.1 per cent.). The average increase in population for Germany as a whole —as compared with the last census—is 8.1 per cent.

However, the published figures are those of a preliminary report, which will be subjected to a thorough revision.

The Dangers with Respect to Pregnancy and Childbirth for Women Employed Industrially

In an address before the Berliner medizinische Gesellschaft on the subject of the disadvantages with regard to pregnancy, birth and childbed resulting for women employed industrially, Dr. M. Hirsch, gynecologist and editor of the *Archiv für Frauenkunde und Eugenik*, recently presented the following data:

Until it will be possible to free all pregnant women (married or unmarried) from the disadvantages of industrial work, the following minimal requirements should be recognized and adopted: (1) prohibition of industrial work, on the part of pregnant women, for the last three months of pregnancy; (2) limitation of industrial work by pregnant women in the fifth and sixth months of pregnancy to four hours a day at the most, and in the third and fourth months of pregnancy to six hours a day, with two hours' rest at noon; (3) remuneration, for the loss of wages, from state funds or from some form of obligatory mutual insurance. As prophylactic measures for pregnant women the following suggestions were made: (1) provision of seats in connection with forms of work that require an uninterrupted standing posture or constant walking about; (2) provision of a pleasantly furnished rest room in large industrial plants where women, not only during the rest periods but also in case of weakness or temporary incapacity, may have an opportunity to lie down on a comfortable couch; (3) provision of medicaments that medical experience has shown to be beneficial in pregnancy; (4) provision of canteens for supplying extra provisions, delicacies, beverages and other articles that meet the special needs of pregnant women; (5) employment of factory physicians; (6) establishment of medical consultation hours for pregnant women in large industrial plants; (7) employment of women physicians as industrial superintendents, with the obligation of devoting special attention to pregnant women and making a special study of the effects of industrial work on the body and the mental and psychic life of women during the period of pregnancy; (8) obligation of the women superintendents to give special time and attention to pregnant women in connection with the labor processes; (9) creation of medical consultation centers for pregnant women in the communes; (10) absolute recognition of pregnancy discomforts as sickness within the meaning of the federal health insurance system as exemplified by the *Krankenkassen*, or health insurance societies; (11) obligation of *Krankenkassen* to assume the expense of medical treatment and the furnishing of medicaments to the families of insured married persons, and (12) assumption by the *Krankenkassen* of the hospital expense of a normal as well as a difficult confinement, with a proper per diem allowance.

Marriages

RUSSELL M. KURTEN, Racine, Wis., to Miss Gertrude Salisbury of Rosendale, at Madison, May 25.

JOHN LAWRENCE KEANE, Cascade, Iowa, to Miss Inez Catharine Krapfi of Dyersville, August 18.

GERALDINE M. HAMILTON, Battle Creek, Mich., to Mr. Lionel G. Crocker of Ann Arbor, August 15.

RICHARD LESLIE BOWER, Madison, Wis., to Miss Alice Louise Gall of St. Paul, Minn., June 27.

HENRY G. PLASTER to Miss Jerusha Steele Lohman, both of Washington, D. C., April 30.

HALL H. RATCLIFFE to Miss Mary Louise Richardson, both of Natchez, Miss., June 11.

STELL R. LEHR, Berkeley, Calif., to Mr. Max M. Zimmerer of Hollywood, August 5.

MARY EVANS BROWN to Mr. Ernest B. Graham, both of Zanesville, Ohio, July 23.

EZRA EUGENE NEFF, Madison, Wis., to Miss Ruth Perry of Beverly, Mass., June 2.

DON G. LEW to Miss Helen Wai-sih Yuan, both of Tsingtao, China, May 10.

Deaths

John Daniel Pifer, Morgantown, W. Va.; Medical College of Ohio, Cincinnati, 1887; Bellevue Hospital Medical College, New York, 1888; member of the Missouri State Medical Association, and the American Academy of Ophthalmology and Oto-Laryngology; formerly on the staff of St. Mary's Hospital, Joplin, Mo.; aged 62; died, August 25, of arteriosclerosis.

Patton Kimbrough Pierce, Eutaw, Ala.; University of Virginia Department of Medicine, Charlottesville, 1921; member of the Medical Association of the State of Alabama, and the Medical Society of Virginia; aged 30; died, August 18, at a hospital in Harrisburg, Va., of injuries received, when the automobile in which he was driving overturned.

John A. Grier, Sistersville, W. Va.; College of Physicians and Surgeons, Baltimore, 1894; member of the West Virginia State Medical Association; member and past president of the board of education; formerly city health officer; aged 55; died, August 27, at the Ohio Valley General Hospital, Wheeling, following an appendectomy.

Joseph W. Fowler, Louisville, Ky.; Louisville Medical College, 1890; member of the Kentucky State Medical Association; formerly superintendent of the Louisville City Hospital; past president of the Louisville Board of Pharmacy and the Louisville College of Pharmacy; aged 72; died, August 23.

Francis C. Ford, Nacogdoches, Texas; University of Alabama School of Medicine, Tuscaloosa, 1873; Medical Department University of Louisiana, New Orleans, 1880; Spanish-American War veteran; aged 75; died, August 23, of heart disease.

George J. C. Wintermute, Phoenix, Ariz.; Cincinnati College of Medicine and Surgery, 1875; Civil War veteran; formerly member of the state legislature; past president of the Ohio State Board of Pharmacy; aged 84; died, August 24.

Edwin W. Garberich, Spokane, Wash.; University of Pennsylvania School of Medicine, Philadelphia, 1865; Civil War veteran; formerly druggist; aged 83; died, August 14, at the Washington Veterans' Home and Hospital, Retsil.

Raymond Regan Harrington ✠ Chicago; Northwestern University Medical School, Chicago, 1912; member of the Chicago Ophthalmological Society; aged 35; died, August 5, of chronic nephritis and edema of the lungs.

Albin Victor Ohlson, Kane, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1922; member of the Medical Society of the State of Pennsylvania; aged 29; died, August 22, of cardiac thrombosis.

Edgar Joy Gibson, Fort Atkinson, Wis.; Hahnemann Medical College and Hospital, Chicago, 1880; for twenty-six years health officer of Fort Atkinson; aged 70; died, August 14, following a long illness.

Jesse M. Burford, Independence, Tex.; Medical Department of the Tulane University of Louisiana, New Orleans, 1887; member of the State Medical Association of Texas; aged 64; died, August 23.

John P. Salb, Jasper, Ind.; Medical College of Indiana, Indianapolis, 1880; member and past president of the Indiana State Medical Association; formerly bank president; aged 70; died, August 22.

Charles Pomeroy Graves, Canon City, Colo.; Cleveland University of Medicine and Surgery, 1862; University of Buffalo (N. Y.) Department of Medicine, 1876; aged 94; died, in August.

Linwood D. Batkins, Richmond, Va.; Medical College of Virginia, Richmond, 1894; member of the Medical Society of Virginia; aged 51; died, August 25, at St. Elizabeth's Hospital.

Benjamin Barrington Jameson, Columbus, Ga.; Atlanta Medical College, 1887; member of the Medical Association of Georgia; aged 67; died, August 25, following a long illness.

George M. Tyrrell, Freeport, Ill.; College of Physicians and Surgeons, Keokuk, 1888; member of the Illinois State Medical Society; aged 63; died, August 26, of heart disease.

Burton Otis Young ✠ Texhoma, Okla.; Lincoln (Neb.) Medical College, 1902; aged 49; died, August 6, at the Epworth Hospital, Liberal, Kan., of gangrenous appendicitis.

Cassidy Chenoweth ✠ Decatur, Ill.; Rush Medical College, Chicago, 1869; aged 77; died, August 22, at the Decatur and Macon County Hospital, of carcinoma of the throat.

John H. Bowman, Vickery, Ohio; Columbus Medical College, 1890; member of the Ohio State Medical Association; aged 66; died, August 14, of cerebral hemorrhage.

Charles F. Ballard ✠ Havelock, Neb.; Medical College of Indiana, Indianapolis, 1879; formerly member of the board of education; aged 59; died suddenly, August 17.

Andrew J. Gibson, Duluth, Minn.; University of Edinburgh, Scotland, 1894; member of the Minnesota State Medical Association; died, August 18, at Creetown, Scotland.

James Allan McMurray ✠ Marion, Ohio; Western Reserve University School of Medicine, Cleveland, 1888; aged 61; died, August 25, of cerebral hemorrhage.

Welton C. Williams, Vienna, Va.; George Washington University Medical School, Washington, D. C., 1899; aged 52; died, August 23, following a long illness.

Charles W. Driesbach, Opportunity, Wash.; Western Reserve University School of Medicine, Cleveland, 1889; aged 58; died, August 20, at Addie, Idaho.

John Denton, Leicester, N. Y.; Bellevue Hospital Medical College, New York, 1879; aged 73; died, August 14, of cerebral hemorrhage and heart disease.

Loddie Whitney Williams, Winchester, Tenn.; Medical Department University of Nashville, 1890; aged 64; died, August 17, following a long illness.

Joseph Grant O'Brien, Jr. ✠ Butte, Mont.; Johns Hopkins University Medical Department, Baltimore, 1919; aged 31; died, August 21, of carcinoma.

Henry Milton Chapman ✠ Bangor, Maine; Medical Department of the University of the City of New York, 1895; aged 54; died, in August.

Hugh P. Gilkeson, Warrensburg, Mo.; Hahnemann Medical College and Hospital, Chicago, 1882; aged 66; died, August 16, of arteriosclerosis.

James Hamilton Walker ✠ Effingham, Ill.; Barnes Medical College, St. Louis, 1896; aged 59; died suddenly, in August, of heart disease.

Enoch Anthony, Ottumwa, Iowa; Keokuk Medical College, 1895; member of the Iowa State Medical Society; aged 66; died, August 20.

Oliver Augustus Byers ✠ Petersburg, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1901; aged 50; died, August 24.

Samuel G. Herrington, Los Angeles; Miami Medical College, Cincinnati, 1879; aged 73; died, August 1, of arteriosclerosis.

Samuel Mays Bradshaw, Rock Valley, Iowa; Louisville (Ky.) Medical College, 1886; aged 71; died, in August, of angina pectoris.

Solomon W. Cohen, Cincinnati; Pulte Medical College, Cincinnati, 1878; aged 79; died, August 25, at Chicago, of heart disease.

Joseph Mangold, Lynch, Neb.; University of Cologne, Germany, 1920; died, June 21, of injuries received in an automobile accident.

Robert Lee Patton, Telford, Tenn.; College of Physicians and Surgeons, Baltimore, 1889; aged 62; died, August 17, of tuberculosis.

James H. Purifoy, Montgomery, Ala.; Reform Medical College, Macon, 1857; Civil War veteran; aged 91; died, August 20.

Volney C. Van Liew, Lennon, Mich.; Michigan College of Medicine, Detroit, 1884; aged 67; died, August 15, of angina pectoris.

Henry Hugh Brockman, Eldon, Mo.; American Medical College, St. Louis, 1877; aged 74; died suddenly, August 19.

Joshua C. Bridges, Sherman, Tex.; Homeopathic Medical College of Missouri, St. Louis, 1881; aged 88; died, August 15.

William B. Dills, New York (licensed, New York, 1898); also a dentist; aged 51; died, July 31, of cerebral thrombosis.

Edwin W. Ellis, Muncie, Ind.; Physio-Medical College of Indiana, Indianapolis, 1880; aged 73; died, July 25.

David S. Murphy, Kokomo, Ind.; Curtis Physio-Medical Institute, Marion, 1890; aged 58; died, August 24.

Gustavus Conklin ✠ Orwell, Pa.; Jefferson Medical College of Philadelphia, 1862; aged 88; died, August 14.

G. D. Bayhan, Nipgen, Ohio (reregistered in 1896 by years of practice); aged 62; died, August 5.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

THE AMERICAN ACADEMY OF PROCTOLOGY

The Latest Thing in the Special Society Line

Of new medical or quasi-medical organizations there is no end. Hardly a week passes, surely not a month passes, but some new society devoted to furthering the interests of some individual or group is brought into being with more or less pomp and circumstance, and the physicians are invited to "come on in, the water's fine."

During the past week or ten days letters have been coming in of which the following are more or less characteristic:

A West Virginia physician writes:

"I am enclosing a letter from the American Academy of Proctology at Evansville, Indiana. Would you recommend this organization?"

From Kansas comes this note:

"I have been getting quite a little 'dope' from the American Academy of Proctology. The Secretary's office is 307 Cleveland Life Building, Evansville, Indiana. Please give me a report on this Academy. Does fellowship in it mean much?"

And from Ohio:

"Will you please advise me regarding the standing of the officers of the American Academy of Proctology whose letter is enclosed?"

All of the correspondents sent in form letters—all alike—that they had received from the "Secretary-Treasurer" of the American Academy of Proctology at Evansville, Indiana, and signed "W. G. French, Secretary-Treasurer." The stationery gives the names of the directors of this new organization thus:

JOHN M. AULD, President, Chicago, Ill.
LINDSEY MORRISON, First Vice-President, Hammond, Ind.
DAVID O. THOMAS, Second Vice-President, New Kensington, Pa.
WM. G. FRENCH, Secretary & Treasurer, Evansville, Ind.

The letters, which are printed in imitation of typewriting with the name and address of the physician to whom it is sent filled in on the typewriter, read as follows:

"*Dear Doctor:*—As a Proctologist, you are eligible for fellowship in this Academy. Our charter membership is limited to twenty-five, and you are invited to make application for active fellowship. You will note on the application blank, which we enclose, the requirements for Fellowship—Numbers 3 and 4 will be waived for charter members, provided the major part of their work is Proctology.

"The object of this organization is, the investigation and dissemination of knowledge relating to the study of the Rectum, Anus and Colon, and to promote the science and art of the practice of this specialty in Medicine and Surgery. To elevate the standard of Proctology, to familiarize the members of the Medical Profession and Public with its aims and ideals, to protect the Public against irrepsonsible and unqualified practitioners. To receive applications for examination of Specialists in Proctology, to conduct examinations of such applicants, to issue certificates of qualification in Proctology and to perform such duties as will advance the cause of Proctology and encourage high ethical standards in this branch of the Medical Profession.

"We would be pleased to have you affiliate with us. If agreeable to you, please fill out the application form, and return it to us at your earliest convenience, as we only have seven vacancies to be filled.

Fraternally yours,
W. G. FRENCH, Sec'y-Treas.

"P. S. Would be glad to mail you a copy of our Constitution and By-Laws on request."

The letter, thus, is an invitation to become one of the last seven of twenty-five charter members of the American Academy of Proctology. Strange that it should require so many letters to get seven applications for this honor (?). Note also the reference to the five requirements for fellowship that are given on the Application Blank that accompanies the form letter. These requirements are:

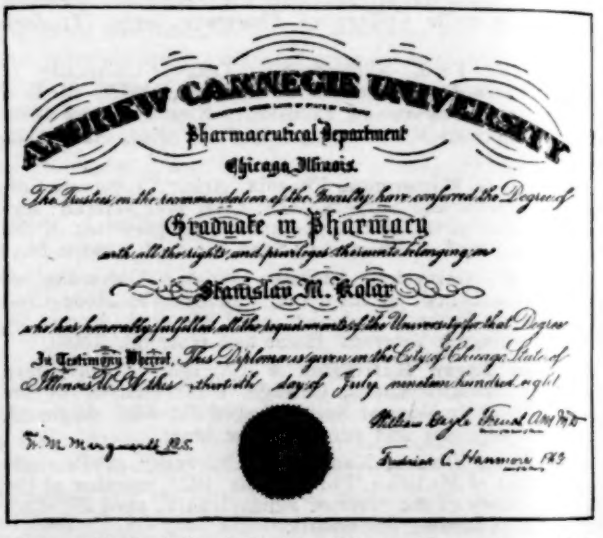
"1. Graduates of Recognized Medical Schools.
"2. Member of County and State Medical Societies.
"3. In Practice of Proctology Past Five Years.
"4. Examination Satisfactory to the Board of Censors.
"5. Payment of Membership Fee $10.00 includes dues for ensuing year."

The application blank also calls for the name, address and various biographical and professional data. Referring again to the form letter that accompanies the application it will be noted that Requirements 3 and 4 for fellowship will be waived for charter members provided the major part of the work done by the physician is proctology. It is worthy to note also that some of the objects of the American Academy of Proctology are "to protect the Public against irresponsible and unqualified practitioners" of this specialty, "to conduct examinations" of specialists in proctology, and "to issue certificates of qualification" as well as to perform certain miscellaneous duties.

PROFESSIONAL RECORD OF WILLIAM GAYLE FRENCH

It seems reasonable to believe that the American Academy of Proctology of Evansville, Indiana, is the brain child of William Gayle French, M.D., of Evansville, Indiana, its Secretary-Treasurer. In view of the professional record of Dr. French, both in the near and distant past, THE JOURNAL feels that the profession should be given such information as may permit it to evaluate the probable ethical and scientific status of an organization founded by him.

According to material in the American Medical Association's files, William Gayle French was born in 1885, and holds a diploma from the Hahnemann Medical College and Hospital of Chicago in 1906. He was licensed in Texas and Michigan in 1907, in Indiana in 1908, in Illinois in 1913 and in Maryland


ANDREW CARNEGIE UNIVERSITY
Pharmaceutical Department
Chicago, Illinois.
The Trustees on the recommendation of the Faculty have conferred the Degree of
Graduate in Pharmacy
with all the rights and privileges thereunto belonging on
Stanislaw M. Kolar
who has honorably fulfilled all the requirements of the University for that Degree
In Testimony Whereof, This Diploma is given on the City of Chicago, State of Illinois, this third day of July nineteen hundred eight

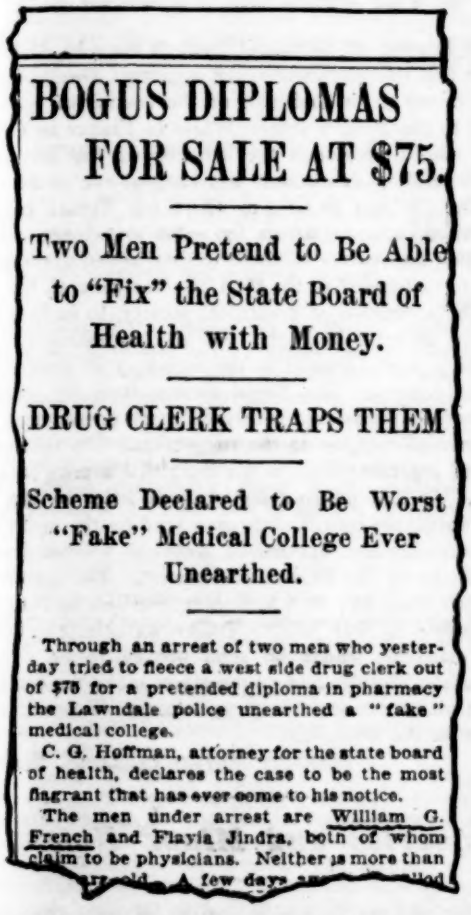
Photographic facsimile of the fake diploma sold to a drug clerk for $75. Notice the signature of William Gayle French, A.M., M.D., signed to the diploma as "President of the Board of Trustees." Chicago newspapers reported this case, culminating in the arrest of French.

in 1917. The medical directories indicate that Dr. French has changed addresses many times since he was graduated. In 1906 he was at Brook, Indiana, in 1909 at Greensburg, Indiana, in 1910 at Indianapolis, in 1912 at Kingsbury and La Porte, Indiana. From 1914 to 1916 inclusive he was in Chicago. Other records show that French was in Detroit in 1912 and 1913, in Evansville, Indiana, and Chicago in 1920, and back again in Evansville in 1923.

In 1907 William Gayle French and three other men incorporated the "Harvey Medical College and Hospital" of Chicago. This so-called college is not to be confused with the Harvey Medical College of Chicago, which really had teachers and laboratories, enrolled students and issued annual announcements, for the latter institution went out of practical existence in 1905. The William Gayle French Harvey Medical College changed its name in November, 1908, to Jackson University with French as its president. In September, 1909, the name was changed to Jefferson University with French as notary public. In May, 1912, the charter was dissolved, the notice of dissolution being filed by French and others. This so-called medical college, which apparently never had any actual existence as a teaching institution, appears to have issued at least one diploma to an individual who went over to Australia and attempted to practice medicine on it. The name of William Gayle French appeared on this bogus

diploma as "President of the Board of Trustees." The whole matter was exposed in THE JOURNAL of the American Medical Association, August 2, 1919.

In 1908 the Illinois Board of Health *Bulletin* for October contained the name of W. G. French and stated: "Authorization for prosecution has been issued." The December issue of the same *Bulletin* carried the statement, under the name of W. G. French, "Has been practicing medicine, according to reports, in Chicago. Account of insufficient evidence case



BOGUS DIPLOMAS FOR SALE AT $75.

Two Men Pretend to Be Able to "Fix" the State Board of Health with Money.

DRUG CLERK TRAPS THEM

Scheme Declared to Be Worst "Fake" Medical College Ever Unearthed.

Through an arrest of two men who yesterday tried to fleece a west side drug clerk out of $75 for a pretended diploma in pharmacy the Lawndale police unearthed a "fake" medical college.

C. G. Hoffman, attorney for the state board of health, declares the case to be the most flagrant that has ever come to his notice.

The men under arrest are William G. French and Flavia Jindra, both of whom claim to be physicians. Neither is more than [illegible] A few days [illegible]

Photographic facsimile of the opening paragraphs of a newspaper story appearing in the Chicago *Tribune*, Aug. 2, 1908, regarding the arrest of William Gayle French on the charge of selling a fake diploma to a drug clerk.

was non-suited." It will be remembered that W. G. French was not licensed in Illinois until 1913.

The Chicago *Tribune* for August 2, 1908, carried a story of the sale of a bogus diploma. The newspaper reported that William Gayle French and one Flavia Jindra had been arrested on the charge of attempting to fleece a drug clerk out of $75 for a pretended diploma in pharmacy issued by the so-called "Andrew Carnegie University." We reproduce in miniature the bogus diploma in which it will be noted that the name of William Gayle French appears as "President of the Board of Trustees." It will also be noted that after French's name appears the degree "A.M." as well as the "M.D."

For some years there was a fraudulent diploma mill known as the "Oriental University" operated from Washington, D. C., and a small town in Virginia. In a "Catalogue" of this fake institution, issued in 1912, there appears the name of William G. French, M.D., Kingsbury, Indiana, as a "graduate" to whom had been given the degrees "A.M." and "LL.D." In its 1916 catalogue the name "Professor W. G. French, College President" appears as one of the "graduates" of the Oriental University who had received one of the "Doctor diplomas." The Oriental University was finally put out of business, being declared a fraud by the United States Government and debarred from the use of the United States mails.

In October, 1915, news items appeared in Chicago papers reporting the arrest of William Gayle French and another physician in connection with an alleged abortion produced on a young woman who died under the operation. French, who according to the report administered the anesthetic, was exonerated. The other man seems to have been held by the grand jury.

In June, 1918, French made the front page in Detroit newspapers. A story under the head "Warrants Out For Quacks" recorded that warrants had been issued for the arrest of W. G. French, charging him with violating the state law prohibiting the issuance of advertisments for the treatment of venereal diseases. The Detroit *Times* for July 1, 1918, under the heading "Dr. French Flees City" said in part:

"The quacks are on the run. Dr. W. G. French, whose 'Sick Men' advertisements were the delectation of readers of morning and evening family newspapers, has left the city two jumps ahead of the warrant which Special Prosecutor Henry A. Montgomery swore out against him following the *Times* exposures. . . .

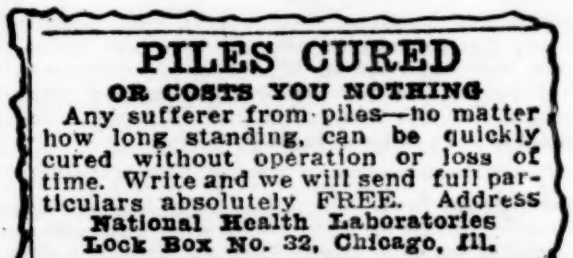
"Dr. French left between two days. When the officers went to his place at No. 61 Monroe-ave. they found the place locked. The place was raided, and papers were seized. Now Prosecutor Jasnowski proposes issuing a new warrant against French charging him with 'obtaining money under false pretenses.' A victim complains that he paid French money for tuberculosis treatment when he did not have this disease at all."

A letter from the Secretary of the Michigan State Board of Registration in Medicine, written July 23, 1918, had this to say in connection with French:

"DR. WILLIAM GAYLE FRENCH, Detroit,—Two warrants issued against him, one for immoral advertising and the other for obtaining money under false pretenses. Warrants were not served owing to the fact that he left for parts unknown before service could be effected."

In 1920 French, apparently, was back in the old home town, Evansville, Indiana, and according to a letter received from an Evansville physician, in February of that year, French was at that time associated with Steven E. Luckett, for years a notorious advertiser.

In August, 1921, a "pile cure" advertisement of the "National Health Laboratories," Lock Box 542, Chicago, Ill., appeared in one of the Evansville, Indiana, papers. The advertisement described an alleged cure that was said to dissolve piles in ten minutes, and to cure many of the worst cases in four days. Sufferers were urged to write to Lock Box 542, Chicago, and get information about the free treatment. Those who answered the advertisement that appeared in the Evansville paper received a form letter from the "National Health Laboratories" of Chicago, enclosing a professional card of William G. French of Evansville, and stating that French would administer the "painless dissolvent



PILES CURED
OR COSTS YOU NOTHING
Any sufferer from piles—no matter how long standing, can be quickly cured without operation or loss of time. Write and we will send full particulars absolutely FREE. Address
National Health Laboratories
Lock Box No. 32, Chicago, Ill.

Photographic facsimile (slightly enlarged) of the second series of "pile cure" advertisements appearing in an Evansville, Indiana, paper. This advertisement appeared in July, 1924. Inquiry brought the statement that Lock Box 32 was rented by William Gayle French!

treatment." The letter stressed French's "fifteen years of experience" and stated that as French was a busy physician, and in order to prevent the patient waiting they were enclosing one of the "doctor's cards on which an appointment has been made for you."

FRENCH'S PROMISE OF REFORM

In 1923 William Gayle French declared that he was going to "run straight."

One year later, in July, 1924, another pile cure advertisement appeared in the same Evansville paper. This time it was the "National Health Laboratories, Lock Box 32, Chicago, Ill." A prospective patient from Evansville wrote to the National Health Laboratories, Lock Box 32, Chicago, and received in reply a card *mailed from Evansville*, reading: "Dr. Wm. G. French. Practice Limited to Diseases of the Rectum. Piles and other diseases of the rectum and anus treated without surgery or detention from business."

This matter was brought to the attention of the Bureau of Investigation and it was learned that Lock Box 32, Chicago, Ill., was rented by William Gayle French, Evansville, Indiana! And this was a year after French had voluntarily announced that he was going to practice ethical medicine!!

In February, 1925, William Gayle French, for some reason not evident on the surface, but not difficult to understand by those who are familiar with local conditions, was accepted as a member of his local medical society—that of Vanderburgh County, Indiana. Immediately thereafter French attempted to qualify as a Fellow of the American Medical Association. He was told that on account of his past record his application for Fellowship would be brought before the Judicial Council of the American Medical Association. French wrote admitting that his past actions had been "wrong and unethical" but implying, without making a positive statement to that effect, that since his promise in 1923 he had been practicing ethical medicine. He added:

"I am very sorry indeed my past was as it was, and assure you it never did meet my approval, and my conscience was always disturbed. However, I never was as bad as I was thought to be."

On receipt of his letter French was written to asking whether he had, at that time or recently, a connection with an alleged laboratory supposed to be located in Chicago, that had advertised in Evansville newspapers. Information on this point was requested in order that a statement from French could be presented to the Judicial Council. French made no statement, either verbally or by letter on this point, but on May 8, 1925, he withdrew his application for Fellowship.

During the time that elapsed between his application for Fellowship and his withdrawal of that application, a display advertisement appeared in the program of a vaudeville theater at Evansville, notifying the Evansville public that W. G. French specialized in "rectal diseases." This appeared during the week of April 12, 1925, two months after he had been admitted to membership in his local medical society.

Such then is the professional history of William Gayle French, M.D., of Evansville, Indiana, the Secretary-Treasurer of the "American Academy of Proctology," which is to conduct examinations of specialists in proctology, issue certificates of qualification and "encourage high ethical standards" in this branch of medical practice.

Under the circumstances THE JOURNAL feels constrained to suggest that proctologists who may have been invited to join the American Academy of Proctology withhold their applications—and their $10—until better evidence is available to indicate that this new organization is going to be so conducted as to be an honor to the profession.

Federal Health Laws.—The federal health laws as enacted from time to time are the direct results of repeated epidemics. On account of smallpox, vaccine virus was introduced voluntarily by an officer of the service in 1807. In 1813 a law was passed to encourage vaccination by providing for the distribution of vaccine virus. The first permanent quarantine law, enacted April 29, 1878, followed a severe and widespread epidemic of the previous year. The passage of the law of Feb. 15, 1893, was intimately associated with the cholera outbreak in Europe in 1892, and the quarantine act of June 19, 1906, followed the epidemic of yellow fever in the Southern states in 1905. Under these and a few minor laws, the national system or maritime quarantine was developed. A peculiar feature of this system is that existing regulations automatically become operative on the occurrence of epidemics in foreign ports, thus obviating the necessity for the promulgation of quarantine against a particular port.—Kerr, J. W: *Pub. Health Rep.* **40**:1679 (Aug. 14) 1925.

Correspondence

THE INTERALLIED SURGICAL CONFERENCE

To the Editor:—On page 281, THE JOURNAL, July 25, appears the following statement from your Belgian correspondent:

"It was also Depage who, together with his friend Tuffier, induced the allied governments to establish at Paris an interallied surgical conference. The great work accomplished by this conference and the far-reaching influence that it had on the evolution of modern war surgery are well known."

In the interest of historical truth it may be desirable to point out that this statement is not accurate. During the war I had the honor to be chairman of the council of consultants attached to the British army. While in France in 1914-1915, I had inspired at Rouen the creation of the first medical society formed in connection with any of the allied armies. The success of this society, to which our French colleagues were invited, and to which by solid knowledge, vigor of declamation and gaiety of rhetoric they added great interest, caused me to suggest to the then director general, Sir Alfred Keogh, the formation of a surgical society, to include all the allies, and to meet in Paris. At his suggestion I wrote a letter which went forward to the secretary of state for war, Mr. Lloyd George. Mr. Lloyd George took the suggestion eagerly and communicated with the French government, which gave immediate support to the suggestion. The first meeting of selected representatives of all the allied armies took place in Paris. At that meeting my original letter to Mr. Lloyd George, translated into French, was read by the under secretary of state for the "Service de santé" as a letter from Mr. Lloyd George to the French government. The inauguration of the conference was then and there ascribed to the suggestion contained in that letter. Tuffier was elected chairman, and an excellent leader he soon proved to be. He and Depage worked loyally and untiringly to make the conference, in all its many meetings, a great success. But neither had any voice in the initiation.

BERKELEY MOYNIHAN, Leeds, England.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

ZINC STEARATE POISONING

To the Editor:—My little 8 months old grandson yesterday, in spite of all precautions, inhaled some zinc stearate, followed by violent coughing and vomiting, but no cyanosis. The articles I can find in THE JOURNAL do not refer to the later symptoms. Can you give me the later symptoms and results when death is not produced at once? Are there any true poisoning symptoms other than local lung symptoms? Has any treatment been advised? This patient does not seem very ill or cough very much, but has a temperature of 102.

E. T. EDGERLY, M.D., Ottumwa, Iowa.

ANSWER.—The effect produced by the aspiration of zinc stearate consists in the production of an acute disturbance of the bronchi and lungs. The cases that have been reported may be divided into several types:

1. The fulminating variety, in which the onset is sudden and stormy, with rapid respirations and cyanosis. Complete asphyxia may occur, and the patient may die within twenty-four hours after the accident.

2. In another group an acute bronchopneumonia may develop with the characteristic signs and symptoms, and the process may last from two to three weeks, the temperature varying from 99 to 105 F. Respirations may be rapid. Cyanosis is frequent at the onset. The pulse is rapid, and abdominal distention may occur. Recovery is by lysis during the third week.

3. In a third group of cases, the course of the illness is brief. The patients, after the initial suffocative symptoms, recover gradually without definite involvement of the lungs.

In this group the temperature may be only slightly elevated, and the symptoms may last only three days.

Heiman and Aschner have shown experimentally that the insufflation of zinc stearate produces interstitial pneumonia and peribronchitis. They have also shown that the lesions produced are more severe or more lasting than those produced by other powders. The evidence at hand does not justify the conclusion that zinc stearate acts as a mineral poison, but on account of its physical properties and is tenacious qualities, it causes occlusion of bronchi and lung alveoli.

Essentially, the treatment is prophylactic. Manufacturers should dispense the powder only in a container with a suitable self-closing top. In other respects the treatment is similar to that of any bronchopneumonia. Oxygen inhalations have been warmly advocated.

ROBES' ANTI-RHEUMATIC INJECTIONS

To the Editor:—The enclosed item about Robes' Anti-Rheumatic Injections came into my hands today and it is sent to you hoping that attention being directed to it in your "Propaganda for Reform" column may have a deterrent effect. It is unfortunate that with all the activity exercised by the U. S. government in the matter of prohibition, the mails can still be used for such dangerous and nefarious purposes.

WILLIAM F. LOCKWOOD, M.D., Baltimore.

ANSWER.—While the advertising for Robes' Anti-Rheumatic Injections, which is sent out by Robes' Intravenous Products, Inc., leads one to believe that the product is some form of streptococcus vaccine, an advertisement containing a report of the analysis of the product indicates that the preparation consists of nothing more than minute amounts of mercuric chlorid and traces of guaiacum in a physiologic solution of sodium chlorid, containing about 7 per cent. of alcohol. Neither mercuric chlorid nor guaiacum is recognized as having antirheumatic properties. The preparation has not been accepted for New and Nonofficial Remedies.

The provisions of the Food and Drugs Act apply to the trade packages of medicinal products; that is, a prosecution for unwarranted claims can be instituted under the Food and Drugs Act, only if these claims are made on or in the trade package. Advertising matter circulated through the mail does not come under the law. Government authorities might institute proceedings against a product which is marketed with unwarranted therapeutic claims under the postal law which is invoked in the case of mail order frauds. It would probably be a difficult matter to secure a prosecution for products that are exploited to the medical profession with unwarranted claims, for the reason that it could undoubtedly be shown that some physicians had used such products. The only protection against unwarranted therapeutic claims made for proprietary products which physicians have today is their own critical judgment and, if they wish to avail themselves of it, the protection afforded by the Council on Pharmacy and Chemistry of the American Medical Association. Physicians who limit their use of unofficial products to those that are admitted to New and Nonofficial Remedies will advance rational medicine, protect themselves and benefit their patients.

DISINFECTION AFTER TUBERCULOSIS

To the Editor:—What is considered the best method of disinfecting a house that has been occupied for three or four years by a tuberculous patient?

S. J. HANKS, M.D., Hurley, N. M.

ANSWER.—It is generally recognized by the more progressive health authorities that house fumigation as heretofore practiced is of almost no value in the prevention of the spread of disease. Many pathogenic germs have only a brief existence outside the body, while even the more resistant varieties are not found on the walls or ceilings or hiding in the curtains of a sickroom. They are found on articles that have come in contact with the patient. The tubercle bacillus is among the more resistant of the disease germs, partly because of the presence of a waxy substance in the cell wall and partly because, in pulmonary tuberculosis, it leaves the body enclosed in mucous matter which protects it from the action of sunlight and other germicidal agents. It is doubtful whether the usual fumigators would be of any value in destroying these germs. The only practical, reasonable and effective treatment for a house or room that has been occupied by a tuberculous patient is a thorough cleansing with soap and water. Mechanical removal of material likely to contain the germs is preferable to disinfection in this case.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 19. Sec., Dr. H. W. Loeb, 1402 South Grand Blvd., St. Louis, Mo.

ARIZONA: Phoenix, Oct. 6-7. Sec., Dr. W. O. Sweek, 404 Heard Bldg., Phoenix.

CALIFORNIA: Sacramento, Oct. 19-22. Sec., Dr. Charles B. Pinkham, 906 Forum Bldg., Sacramento.

COLORADO: Denver, Oct. 6. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DISTRICT OF COLUMBIA: Washington, Oct. 13. Sec., Dr. Edgar P. Copeland, Stoneleigh Court, Washington.

FLORIDA: Tallahassee, Oct. 13-14. Sec., Dr. W. M. Rowlett, Citizens Bank Building, Tampa.

GEORGIA: Atlanta, Oct. 13-15. Sec., Dr. C. T. Nolan, Marietta.

HAWAII: Honolulu, Oct. 12-15. Sec., Dr. Guy C. Milnor, 401 Beretania St., Honolulu.

IDAHO: Boise, Oct. 6. Commissioner of Law Enforcement, Mr. F. A. Jeter, Boise.

ILLINOIS: Chicago, Oct. 6-8. Director, Mr. A. M. Shelton, Capitol Bldg., Springfield.

IOWA: Des Moines, Oct. 14-16. Dir. of Examinations and Licenses, Mr. H. W. Grefe, Des Moines.

KANSAS: Topeka, Oct. 13. Sec., Dr. Albert S. Ross, Sabetha.

MICHIGAN: Lansing, Oct. 13-15. Sec., Dr. Guy L. Connor, 707 Stroh Bldg., Detroit.

MINNESOTA: Minneapolis, Oct. 6-8. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.

MISSOURI: Kansas City, Oct. 27-30. Sec., Dr. James Stewart, Jefferson City.

MONTANA: Helena, Oct. 6. Sec., Dr. S. A. Cooney, Power Bldg., Helena.

NATIONAL BOARD OF MEDICAL EXAMINERS: Part III, Baltimore, Oct. 15. All applications for this examination must be made on or before Oct. 1. Sec., Dr. J. S. Rodman, 1600 Walnut St., Philadelphia.

NEW JERSEY: Trenton, Oct. 20-21. Sec., Dr. Alex. Macalister, Trenton Trust Bldg., Trenton.

NEW MEXICO: Santa Fe, Oct. 12-13. Sec., Dr. W. T. Joyner, Roswell.

NEW YORK: Albany, Buffalo, New York City and Syracuse, Sept. 21-24. Chief, Education Dept., Mr. Herbert J. Hamilton, Albany.

RHODE ISLAND: Providence, Oct. 1. Sec., Dr. Byron U. Richards, State House, Providence.

UTAH: Salt Lake City, Oct. 6. Director of Regis., Mr. J. T. Hammond, 412 State Capitol Bldg., Salt Lake City.

WEST VIRGINIA: Charleston, Oct. 13. Sec., Dr. W. T. Henshaw, Charleston.

WYOMING: Cheyenne, Oct. 5-7. Sec., Dr. G. M. Anderson, State Capitol, Cheyenne.

Washington July Examination

Mr. William Melville, secretary of the Washington Department of Licenses, reports the oral and written examination held at Olympia, July 6, 1925. The examination covered 13 subjects and included 100 questions. An average of 75 per cent. was required to pass. Of the 24 candidates examined, 22 passed and 2 failed. Twenty-nine candidates were licensed by reciprocity. One candidate was licensed by endorsement of credentials. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
University of California School of Medicine	(1925)	88.3
Northwestern University Medical School	(1925)	81, 86
Rush Medical College	(1925)	86.3, 88
University of Illinois College of Medicine	(1925)	81.4
University of Minnesota Medical School	(1923) 82.4, (1925)	82
University of Oregon Medical School	(1924)	80, 82
University of Manitoba Faculty of Medicine	(1925)	81, 83, 84.7, 85.2 87.3
McGill University Faculty of Medicine	(1914) (1922) 82.8, (1924) 92.6	82.3,
Queens University Faculty of Medicine	(1924)	84.2, 88.2
University of Western Ontario Medical School	(1923)	79
University of Bishop Faculty of Medicine	(1903)	80.2

FAILED		
College	Year Grad.	Per Cent.
Trinity Medical College	(1904)	73.9
Queens University Faculty of Medicine	(1910)	66.1

LICENSED BY RECIPROCITY		
College	Year Grad.	Reciprocity with
College of Medical Evangelists	(1923), (1924, 2)	California
University of Colorado School of Medicine	(1923)	Colorado
Bennett Medical College	(1912)	Nebraska
College of Physicians and Surgeons, Chicago	(1901) (1908) N. Dakota	S. Dakota
Northwestern University Medical School	(1889) (1912), (1925) Minnesota, (1924) Illinois	Iowa
Rush Medical College	(1889) Idaho, (1922), (1923)	Illinois
University of Illinois College of Medicine	(1915)	S. Dakota
State University of Iowa College of Med.	(1900), (1924)	Iowa
Louisville Medical College	(1893)	Iowa
Tulane University	(1884)	Texas
Harvard University	(1918)	Minnesota

Detroit College of Medicine and Surgery	(1922)	Michigan
University Medical College of Kansas City	(1907)	Kansas
University of Nebraska	(1924)	Nebraska
Eclectic Medical Institute, Cincinnati	(1896)	Illinois
Ohio State University College of Medicine	(1924)	Ohio
University of Oregon Medical School	(1922), (1924, 3)	Oregon

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement with
George Washington University Medical School		(1921)	U. S. Army

Book Notices

THE CONQUEST OF CANCER. By H. W. S. Wright, M.S., F.R.C.S. With an Introduction by F. G. Crookshank, M.D., F.R.C.P. Cloth. Price, $1. Pp. 82. New York: E. P. Dutton & Company, 1925.

CANCER AND THE PUBLIC. The Educational Aspect of the Cancer Problem. By Charles P. Childe, B.A., F.R.C.S., M.R.C.P.E., Consulting Surgeon, Royal Portsmouth Hospital. Cloth. Price, $4.25. Pp. 267. New York: E. P. Dutton & Co., 1925.

Dr. Wright is in charge of surgery in the Shantung Christian University in China. His little book is a part of a series published by the Dutton Company. It is a brief statement on the cancer situation, offering the view that the only hope for control of this disease lies in proper education of the public. Dr. Wright has obviously been out of touch not only with research on cancer but also with public health education, so that his book seems to lack proper perspective. Such advice as he gives is accurate, but the presentation is not attractive.

Dr. Childe, author of the more extensive book, writes in a straightforward, simple manner with a keen sense of humor and a fine analytic intelligence. He is evidently a pioneer in the field of public education, since his first book appeared in 1906. The present volume is much more extensive than was the former one. He begins with a statement relative to the present status of public health education, including a fine tribute to the American Society for the Control of Cancer for its energetic efforts in this direction. He then takes up the various theories that have been offered as to cancer causation and disposes neatly of those that represent "arm-chair philosophizing," at the same time assigning due value to views based on scientific research. Several chapters are devoted to cancer facts and cancer fallacies. The work concludes with a statement of the plan established by Dr. Childe in his own community for education of the public in the control of this disease. The book is an excellent one and may be recommended by the physician to such persons as are interested in the subject.

MANSON'S TROPICAL DISEASES. A Manual of the Diseases of Warm Climates. Edited by Philip H. Manson-Bahr, D.S.O., M.A., M.D., Physician to the Hospital for Tropical Diseases, London. Eighth edition. Cloth. Price, $11. Pp. 895, with 453 illustrations. New York: William Wood & Company, 1925.

Although the original author of this book, Sir Patrick Manson, died since the previous edition was published, not a little of his writing is embodied in this volume. The book has been "drastically" revised, so that it is now about seventy pages shorter than the last edition. The section on medical zoology has been entirely rewritten, and certain formerly obscure diseases have been assigned to their proper groups. There have been added six skeleton maps which show the geographic distribution of various diseases, and ninety-four new illustrations, many of which are in color. The author is to be congratulated on improving a book that was edited so long by his eminent predecessor.

HANDBUCH DER SALVARSANTHERAPIE MIT EINSCHLUSS DER EXPERIMENTELLEN, BIOLOGISCHEN UND CHEMISCHEN GRUNDLAGEN. Herausgegeben von Dr. W. Kolle, o. Honorarprofessor, Geh. Med.-Rat, Direktor des Staatsinstituts für experimentelle Therapie, und Dr. K. Zieler, o. ö. Professor und Direktor der Universitätsklinik für Haut- und Geschlechtskrankheiten in Würzburg. I. Band. Paper. Price, 30 gold marks. Pp. 750, with 20 illustrations. Berlin: Urban & Schwarzenberg, 1924.

This comprehensive work is the result of the collaboration of many authorities and is intended as a reference volume not only for syphilologists and physicians but for chemists and chemotherapeutists as well. The history of the pioneer work in chemotherapy is given in great detail, together with the development of the arsenical derivatives in the experimental work with the trypanosomes. The pharmacology and toxicology of the arsphenamins is well treated, as also is the therapeutic activity and the biologic testing of the various preparations. A chapter is devoted to the chemistry of the arsenicals and another to the fate of the arsphenamins when introduced into the body by the various routes. Other chapters are devoted to the methods and technic of intravenous medication; the therapeutic application of arsphenamin in man; the course of syphilis under such treatment, and the treatment of syphilis with arsphenamin alone and combined with mercury. The bibliography is voluminous, and apparently few references worth while will be found missing. It is an invaluable work for syphilographers and chemotherapeutists.

HANDBUCH DER SALVARSANTHERAPIE MIT EINSCHLUSS DER EXPERIMENTELLEN, BIOLOGISCHEN UND CHEMISCHEN GRUNDLAGEN. Herausgegeben von Dr. W. Kolle, Direktor des Staatsinstitutes für experimentelle Therapie, und Dr. K. Zieler, o. ö. Professor und Direktor der Universitätsklinik für Haut- und Geschlechtskrankheiten in Würzburg. Band II. Paper. Price, 34, 40 marks. Pp. 878, with 25 illustrations. Berlin: Urban & Schwarzenberg, 1925.

The second volume of this exhaustive work is devoted to the clinical aspects of the therapeutics of the various arsenicals. The technic, indications and results of intraspinal therapy are treated at length in the first chapter. The next covers the subject of arsphenamin in hereditary syphilis, and the third that of the exanthems and icterus occuring in the course of arsphenamin therapy. Short chapters are devoted to various arsphenamins. The bibliographies appended to each chapter will be found of great value to those interested in the subjects covered.

PHYSICAL DIAGNOSIS OF DISEASES OF THE CHEST. By Joseph H. Pratt, A.M., M.D., and George E. Bushnell, Ph.D., M.D. Cloth. Price, $5. Pp. 522, with 166 illustrations. Philadelphia: W. B. Saunders Company, 1925.

Under Colonel Bushnell's long administration at Fort Bayard, a standard method of examination of the lungs was developed and taught to medical officers assigned to duty at that hospital. This experience, together with that gained in instructing tuberculosis examiners and other medical officers in training camps during the World War, is the foundation of the first part of this book. It is distinguished by its clear language, by emphasis on findings in the normal chest, by research, and by the omission of doubtful methods of diagnosis. That Colonel Bushnell's diagnostic methods were practical was shown by their adoption in large measure for the tuberculosis examination of millions of men in the draft. There are a few illustrations of tuberculous lungs, which would have reproduced to advantage in colors. The section on diagnosis of heart diseases is well illustrated. The various graphic methods of diagnosis, recently introduced, are considered. The more simple methods of diagnosis—inspection, percussion, palpation and auscultation—are emphasized. As in the first part of the book, an understanding of the normal heart is considered a prerequisite to the study of the diagnosis of heart disease. The point of view throughout the book is that of the clinician. It should be included in the list of standard textbooks on physical diagnosis.

GYNECOLOGY FOR NURSES. By M. J. Seifert, A.B., M.D., F.A.C.S., Attending Surgeon and Gynecologist, Columbus Hospital. Cloth. Price, $3. Pp. 325, with 115 illustrations. New York: D. Appleton and Company, 1925.

The preface states that "the only legitimate excuse for issuing a new book on this subject is the desire to present a new thought or an old subject in a new and practical form." The book is not written in a style that can be easily understood by the average nurse. The sentences seem too long, and too many technical terms are crowded together without adequate explanations of their meaning. Most of the material appears to be a compilation from many textbooks on embryology, anatomy and gynecology. Many of the illustrations are obsolete. The chapter on radiation therapy is of interest, but is too technical to render it of much use except to advanced medical students. The chapter devoted to endocrinology is also indefinite and too general in its recommendations.

Miscellany

FEDERAL AID IN DISASTERS

A special number of the *Red Cross Courier* gives a record of the U. S. government's contributions in times of disaster. Congress granted $50,000 in 1812 to victims of an earthquake in Venezuela, and another to Alexandria, Va., which was burned in 1827. In 1863, Congress voted $200,000 for victims of Indian depredations in Minnesota, and two years after the surrender at Appomattox gave $50,000 to buy seed for Southern farmers; in 1874, a grant of $100,000 to aid victims of high water in the lower Mississippi Valley and $370,000 in 1882 for the same purpose; $500,000 for the Ohio River floods of 1884; $185,000, $200,000 and $1,239,179 for the Mississippi floods of 1890, 1898 and 1912, respectively; $785,428 for the Ohio and Mississippi disaster in 1913, and $540,000 for the floods in Southern states in 1916. The American Red Cross, reorganized by act of Congress in 1905, has as an unofficial agent of the government cooperated with the army and navy and other government agencies in disaster relief. The navy expended $800,000 in the Messina earthquake to buy and transport lumber to Italy, and the Red Cross expended $985,300 contributed by the American people. In the San Francisco fire, 1906, the Red Cross administered a fund of $3,087,469, while the army issued supplies costing $2,500,000. The government made a liberal donation in the Manchurian plague and famine, 1911; gave $200,000 in 1897 to relieve stranded gold seekers in Alaska; $200,000 in 1902 for the Martinique disaster; $3,000,000 for relief in the Philippines in the plague of 1903, and $200,000 to victims of the Salem, Mass., fire in 1914. For war sufferers in Europe, the U. S. government "poured out" $100,000,000 in 1919 for food, $20,000,000 in 1921 for victims of famine in Russia and $4,000,000 in 1922, and gave $200,000 for the Smyrna refugees in 1922. The last great joint foreign relief between the government and the Red Cross was in the Japanese earthquake and fire, 1923, when Congress approved the issue of army stores worth more than $6,000,000, and the American Red Cross disbursed contributions from the American public of $11,631,302.

SMALLPOX EPIDEMIC IN MILWAUKEE

The 1925 epidemic of smallpox in Milwaukee lasted four months, and of the 376 people who had smallpox, eighty-six died. This was the fourth epidemic in the history of the city. In 1871 there was an epidemic which lasted three years, in which about 2,000 people contracted smallpox and 535 died. In 1876 there was an epidemic which lasted two years and 1,200 people had smallpox and 438 died. In 1894 the epidemic lasted more than a year, and 1,100 people had smallpox and 274 died. The commissioner of health, Dr. John P. Koehler, considers now that it will be years before Milwaukee will have another epidemic, because the people have nearly all been vaccinated. In an estimated population of 500,000 during the 1925 epidemic, the health department vaccinated 312,000 people and revaccinated 200,000 more, while private physicians vaccinated 110,000 people. Of the 376 persons that contracted smallpox, 318 had never been vaccinated, fifty-one had been vaccinated more than seven years ago, and only seven had been vaccinated between four and seven years. Not one person with a recent successful vaccination contracted the disease.

Of the eighty-six persons that died, eighty-two had never been vaccinated and the other four were vaccinated from twenty to fifty years ago. Dr. Koehler says that while he heard reports of "a girl losing her arm" as a result of vaccination, a policeman losing his arm and a man dying from vaccination, he always found on investigation that the story was based on a rumor from what was considered a reliable source but later found unreliable, and that while many people had severe reactions, he knows of no death or loss of arm from vaccination in Milwaukee.

Medicolegal

Infection from Gangrenous Body "Accidental Injury"

(Connelly v. Hunt Furniture Co. et al. (N. Y.), 147 N. E. R. 366)

The Court of Appeals of New York, in reversing an order of the appellate division of the supreme court and at the same time affirming an award of the state industrial board under the workmen's compensation law in favor of the claimant for the death of her son (which award was reversed by the appellate division, 207 N. Y. Supp. 695), says that the son was employed by an undertaker as an embalmer's helper. In the line of his duty, he handled a corpse that was full of gangrenous matter, some of which entered a little cut in his hand, and later spread to his neck, when he scratched a pimple with the infected finger. General blood poisoning set in, and caused his death.

The compensation law provides that "'injury' and 'personal injury' mean only accidental injuries arising out of and in the course of employment and such disease or infection as may naturally and unavoidably result therefrom." Here a trifling scratch was turned into a deadly wound by contact with a poisonous substance. This court thinks that the injection of the poison was itself an accidental injury within the meaning of the statute. More than this, the contact had its occasion in the performance of the employee's duties. There was thus not merely an accident, but one due to the employment.

This court attempts no scientifically exact discrimination between accident and disease, or between disease and injury. None perhaps is possible, for the two concepts are not always exclusive, the one of the other, but often overlap. The tests to be applied are those of common understanding as revealed in common speech. The court has little doubt that common understanding would envisage this mishap as an accident, and that common speech would so describe it. Germs may indeed be inhaled through the nose or mouth, or absorbed into the system through normal channels of entry. In such cases their inroads will seldom, if ever, be assignable to a determinate or single act, identified in space or time. For this as well as for the reason that the absorption is incidental to a bodily process both natural and normal, their action presents itself to the mind as a disease and not an accident. Our mental attitude is different when the channel of infection is abnormal or traumatic, a lesion or a cut. If these become dangerous or deadly by contact with infected matter, we think and speak of what has happened as something catastrophic or extraordinary, a mishap or an accident, though very likely a disease also.

If this employee's death was the outcome of an accident, as this court thinks it indisputably was, only a strained and artificial terminology would refuse to identify the accident with the pernicious contact and its incidents, and confine that description to the scratch or the abrasion, which had an origin unknown. On the contrary, when a scratch or abrasion is of itself trivial or innocent, the average thought, if driven to a choice between the successive phases of the casualty, would find the larger measure of misadventure in the poisonous infection. The choice, however, is one that is needless and misleading. The whole group of events, beginning with the cut and ending with death, was an accident, not in one of its phases, but in all of them. If any of those phases had its origin in causes engendered by the employment, the compensation act supplied a remedy.

We make little progress when, viewing infection as an isolated concept, and ignoring its channels of attack or the manner of its coming, we say, on authority of science, that infection is a disease. It may be this, and yet an accident, too. Nor does it clarify the problem much to characterize the act as voluntary, unless we can also say of the volition that there was involved in it foresight of the peril and acceptance of the consequences. Infection may be an aggravation of injuries sustained in the course of the employment and arising therefrom, in which event it enters into the award, though its own immediate cause was unrelated to the

service. It may be an aggravation of injuries which in their origin or primary form were apart from the employment, in which event, if sudden and catastrophic and an incident of service, it will supply a new point of departure, a new starting point in the chain of causes, and be reckoned in measuring the award as an injury itself. It was argued that in the statute infection was coupled with disease as something other than an accident or an injury, though a possible concomitant, but the court thinks that the intention was, by the addition of the words "such disease or infection as may naturally and unavoidably result therefrom," to enlarge and not to narrow. Infection, like disease, may be gradual and insidious, or sudden and catastrophic.

Osteopaths Not Given Right of Physicians and Surgeons

(State ex rel. Finch, Co. Atty., v. Eustace (Kan.), 233 Pac. R. 109)

The Supreme Court of Kansas, in reversing a judgment that was rendered in favor of the defendant and in entering one for the plaintiff, says that the plaintiff commenced this action to obtain a judgment declaring that those licensed to practice osteopathy under the laws of that state cannot under such license practice optometry without a certificate of registration as an optometrist. The defendant contended that he had the right to practice optometry, under his certificate of registration as an osteopath, by virtue of Section 65—1508 of the Revised Statutes of Kansas, which provides that nothing in the act concerning the practice of optometry "shall be construed to prevent regular physicians and surgeons who are registered with the state medical board, as such, from testing eyes and fitting glasses." He supported this contention by arguing that the practice of osteopathy is a part of practicing the healing art, and that, so far as the practice of that art is concerned, the statute providing for the registration of optometrists makes no distinction between those who practice healing art by the administration of medicine or by surgery and those who practice that art according to the science known as osteopathy. Osteopathy, when practiced by a physician or surgeon as is defined in Section 65—1005 of the revised statutes, may be and probably is a part of the art or science of healing; but the practice of osteopathy, while it may be a part of the art of healing, is not comprehended within the term "practicing medicine," nor within the term "surgical operation" as used in Section 65—1005, which in part reads:

> Any person shall be regarded as practicing medicine and surgery within the meaning of this act who shall prescribe, or who shall recommend for a fee, for like use, any drug or medicine, or perform any surgical operation of whatsoever nature for the cure or relief of any wounds, fracture or bodily injury, infirmity or disease of another person.

Section 65—1508, providing that nothing in the optometry act shall be construed as preventing regular registered physicians and surgeons from practicing optometry, does not include those who are registered to practice osteopathy.

Source of Knowledge Determines Competence as Witness

(Dabbs v. Richardson et al. (Miss.), 102 So. R. 769)

The Supreme Court of Mississippi, Division B, holds, in this will case, that, under Section 3695 of the Code of 1906 of that state, a physician is not a competent witness to testify as to facts and information received by him in his capacity as a physician. He is a competent witness to testify concerning the mental condition of a person, though he is the physician of such person, if his information is derived from social or business relations and not by professional relations. But where his knowledge is derived partly from his relation as a physician and partly from social and business relations, the trial judge may determine his competence in view of all the evidence, and if it appears that his information as a physician influenced his judgment, the judge may exclude his evidence from the jury.

Where there is a clear distinction between knowledge derived in a business and social way and knowledge derived in a professional way, the testimony of a physician is competent so far as it is gained from his business and social relation with the person whose sanity is the subject of inquiry. However, where a physician is attending a patient constantly, and dealing with him in a professional capacity, during which and by which he must necessarily acquire information as to what his mental status is, it is within the discretion of the trial judge who has the opportunity to judge of the witness and observe him while he is testifying and during the course of examination to say whether the witness can in fact separate his knowledge acquired in business and in a social way from his knowledge acquired professionally. The witness is not the final and conclusive judge as to whether he can and does separate knowledge acquired professionally or in a business or social way or both.

In this case it was apparent from the whole examination that most of the knowledge of the testator's condition was derived from association during the professional visits of the physician, and, naturally, a physician would note more attentively during the period of professional treatment the acts and conduct of his patient. Of course there is much that can be observed in business and social intercourse bearing on a person's sanity; and the fact that such observations are made by a physician does not disqualify him, provided his knowledge is not obtained during professional employment. The lines in many cases will be exceedingly difficult to draw. As to the testimony excluded in this case as to the mental condition of the testator, the supreme court thinks that under the facts of the case necessarily a part of the witness' knowledge of such condition was obtained by his visit to and treatment of the testator during the days of his last illness, and the court is unable to say that there was error in excluding this part of the physician's testimony.

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 20-24. Dr. Luther C. Peter, Chestnut and 20th Streets, Philadelphia, Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Hot Springs, Va., Sept. 16-18. Dr. James E. Davis, 111 Josephine Avenue, Detroit, Secretary.

American Association of Railway Surgeons, Chicago, Oct. 21-23. Dr. Louis J. Mitchell, 29 East Madison Street, Chicago, Secretary.

American College of Radiology and Physiotherapy, Chicago, Oct. 19-22. Dr. Roy W. Fouts, 121 South 33d Street, Omaha, Neb., Secretary.

American College of Surgeons, Philadelphia, Oct. 26-30. Dr. Franklin H. Martin, 40 East Erie Street, Chicago, Director-General.

American Electrotherapeutic Association, Chicago, Sept. 15-17. Dr. Richard Kovacs, 223 East 68th Street, New York, Secretary.

American Public Health Association, St. Louis, Oct. 19-22. Mr. Homer N. Calver, 370 Seventh Avenue, New York, Executive Secretary.

American Roentgen Ray Society, Washington, D. C., Sept. 22-25. Dr. Charles L. Martin, Baylor Hospital, Dallas, Texas, Secretary.

Association of Military Surgeons of the United States, New York, Oct. 8-10. Col. J. R. Kean, U. S. A. Ret., Army Medical Museum, Washington, D. C., Secretary.

Central States Pediatric Society, Chicago, November 6-7. Dr. H. T. Price, Westinghouse Building, Pittsburgh, Secretary.

Colorado State Medical Society, Colorado Springs, Sept. 29-Oct. 1. Dr. F. B. Stephenson, Metropolitan Building, Denver, Secretary.

Delaware State Medical Society, Wilmington, Oct. 13-14. Dr. W. O. La Motte, Industrial Trust Building, Wilmington, Secretary.

Indiana State Medical Association, Marion, Sept. 23-25. Mr. T. A. Hendricks, Hume Mansur Building, Indianapolis, Executive Secretary.

Interstate Postgraduate Assembly of America, St. Paul, Minn., Oct. 12-16. Dr. W. B. Peck, 82 Stephenson St., Freeport, Ill., Managing Director.

Kansas City Clinical Society, Kansas City, Mo., Oct. 5-9. Dr. James R. McVay, Rialto Building, Kansas City, Mo., Secretary.

Kentucky State Medical Association, Owensboro, Oct. 5-9. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Mississippi Valley Conference on Tuberculosis, Lansing, Mich., Sept. 15-17. Dr. T. J. Werle, 209 W. Shiawassee Street, Lansing, Mich., Executive Secretary.

Missouri Valley, Medical Society of the, St. Joseph, Sept. 30-Oct. 2. Dr. Charles Wood Fassett, 115 East 31st Street, Kansas City, Mo., Secretary.

Pennsylvania, Medical Society of the State of, Harrisburg, Oct. 5-8. Dr. Walter F. Donaldson, Jenkins Arcade, Pittsburgh, Secretary.

Vermont State Medical Society, St. Johnsbury, Oct. 15-16. Dr. William G. Ricker, 29 Main Street, St. Johnsbury, Secretary.

Virginia, Medical Society of, Richmond, Oct. 13-16. Miss Agnes V. Edwards, 104½ West Grace Street, Richmond, Secretary.

Washington State Medical Association, Seattle, Sept. 17-19. Dr. C. H. Thomson, Cobb Building, Seattle, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Sept. 16-18. Mr. J. G. Crownhart, 558 Jefferson Street, Milwaukee, Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL for a period of three days. No foreign journals are available prior to 1920, nor domestic prior to 1923. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested).
Titles marked with an asterisk (*) are abstracted below.

American Journal of Tropical Medicine, Baltimore

5: 269-315 (July) 1925

*Basal Metabolism of Normal Young Man as Affected by Tropic Residence of One Year. W. D. Fleming, Washington, D. C.—p. 283.
Hookworm in Palestine. A. Felix, Jerusalem.—p. 291.
*Blood Serum Globulin in Leprosy. C. N. Frazier and H. Wu, Peking, China.—p. 297.
*Spirochete-Like Filaments in Blood of Dengue Patients and Normal Individuals. M. W. Hall, Manila, P. I.—p. 307.

Effect of Tropics on Basal Metabolism.—Basal metabolic rates, respiratory quotients and other metabolism data are presented by Fleming for a normal white male, 22 years old, seven months after arrival in the tropics and again after a thirteen months' interval. For the first series the basal metabolic rate averaged 3 per cent. minus, for the second series 7 per cent. minus.

Blood Serum Globulin in Leprosy.—The results of the investigations made by Frazier and Wu indicate that Sia's globulin precipitation test is positive in certain cases of leprosy, particularly in the nodular and mixed types of the disease. Of the thirty-two cases of leprosy in which this test was made, seventeen were positive. In all these cases the percentage of blood serum globulin was estimated. The nodular cases showed an average of 4.68 per cent.; the mixed cases, 4.52 per cent.; the active maculo-anesthetic cases, 4.23 per cent. and the latent maculo-anesthetic cases an average of 3.11 per cent. It was impossible to see any relationship between the serum globulin content of the blood of the cases treated with the ethyl esters of chaulmoogra oil, and those not treated, sufficient to make it of any value as a clinical test for determining the efficacy of such treatment. It is suggested, however, that the blood serum globulin and the precipitation test be studied in this relation to ascertain whether or not there is any decrease in the amount of serum globulin or the positiveness of the test parallel with clinical improvement. Apparently the serum globulin in long standing cases, in which the infection has become clinically latent, does decrease to a point within its normal range. This has been true of the malculo-anesthetic cases in this series which have never had any form of treatment, and suggests the close relationship of activity of infection and serum globulin content in leprosy.

Motile Filaments in Blood.—Attention is called by Hall to the existence in the blood of motile filamentous elements, highly suggestive of living organisms. They occur in normal blood as well as in various pathologic conditions. It is suggested that some, at least, of the forms described by Couvy and by Verwoort from dengue and allied fevers may be of this type. Incidentally, the same may be said of the spirochetes described by Blanchard and Lefrou in the blood of blackwater fever. The use of the iron hematoxylin stain of Heidenhain after wet fixation in Bouin's fluid affords a means of distinguishing these spirals from true living organisms, although their differentiation from any forms known at present should not be difficult under the dark field once the existence of these forms is taken into consideration. Some evidence has been adduced in support of the opinion that the platelets rather than the red cells are the main source of these filaments.

Annals of Clinical Medicine, Baltimore

4: 1-88 (July) 1925

Tularemia. E. Francis, Washington, D. C.—p. 8.
*Sprue. B. K. Ashford, San Juan, P. R.—p. 13.
Present Status of Chlorin Gas Therapy. E. B. Vedder, Edgewood Arsenal, Md.—p. 21.
*Surgical Treatment of Angina Pectoris. H. H. Kerr, Washington, D. C.—p. 30.
*Spontaneous Rupture of Heart; Seven Cases. N. D. C. Lewis, Washington, D. C.—p. 36.
Symptomatology of Diseases of Vessels of Extremities in Light of Their Pathology. L. Buerger, New York.—p. 54.
*Pernicious Anemia. O. B. Hunter, Washington, D. C.—p. 62.
*Splenomegaly; Case of Splenic Anemia of Banti Type in Child of Five. F. Leech, Washington, D. C.—p. 73.

Vaccine Therapy of Sprue.—The benefit accruing from the use of *Monilia psilosis* vaccines in the treatment of sprue has been so great that Ashford says he would not like to have to treat sprue without them. When vaccines have been used in addition to diet, the outstanding symptoms of sprue have disappeared in two thirds of the time required by diet alone.

Surgical Treatment of Angina Pectoris.—Kerr has resected the left superior cervical ganglion, together with the superior cardiac nerve in four cases of angina pectoris with complete relief in two, partial relief in one and failure in one. Both of the successful cases were men. One had a high blood pressure and cardiac change, and the other a normal blood pressure and no evidence of a heart lesion. The case of partial relief was in a woman suffering from bilateral pain. Both superior sympathetic ganglia were removed. Her blood pressure was high but there was no evidence of cardiac disease. The case in which failure is recorded was in a man who had bilateral pain. His heart was decompensated at the time of operation. Tachycardia, dyspnea and general anasarca were also present. His blood pressure was $\frac{150}{00}$. He was operated on under local anesthesia three times. First, the left superior ganglion was removed without relief. Then the right superior ganglion was removed without relief, and finally the middle cervical ganglion of the left side and the left stellate ganglion were resected. The character of the pain changed somewhat, but there was no relief and the patient died a cardiac death three months later.

Spontaneous Rupture of Heart.—Seven cases of heart rupture occurring in the mentally disordered, with full necropsy report, are analyzed by Lewis.

Pernicious Anemia.—In a series of forty-two cases of addisonian anemias under Hunter's observation, only two have apparently been cured by transfusion, drugs and dietetic measures. Of the forty-two cases, thirty-four were Type II blood, three were Type IV, and one case was Type III, according to the Moss method of blood grouping. Whether or not there is any significance to the large number of Type II cases, has not been determined. Two of the patients died after transfusion, with hemoglobinemia and hemoglobinuria, indicating hemolysis, one having been transfused thirty-six times, the other twenty-eight times. Both were given homologous blood after direct matching in a last desperate attempt to bring them out of a severe relapse. On the other hand, one patient has had thirty-two transfusions, many times by the same donors without any hemolysis or untoward reactions. All the patients have either shown a frank pyorrhea alveolaris or increased amount of oral bacterial flora, particularly the spirillary forms.

Splenic Anemia.—In Leech's opinion, Gaucher's disease, von Jaksch's disease and Banti's disease, are all of the splenic anemia type, the difference being that they are descriptions of the conditions as they occur in various stages. As far as cure is concerned, it is purely surgical.

Archives of Dermatology and Syphilology, Chicago

12: 159-324 (Aug.) 1925

Nodosites Juxta-Articulaires. P. D. Gutierrez, Manila.—p. 159.
Multiple Sarcoid-Like Granulomas of Skin of Undetermined Nature. J. V. Klauder, Philadelphia.—p. 171.
*Congenital Ichthyosiform Erythroderma. XLII. R. S. Weiss and N. Tobias, St. Louis.—p. 182.
Studies of Hair: V. Factors Affecting Growth. C. H. Danforth, Berkeley, Calif.—p. 195.
*Epidermophytosis, Sequel of Vaccination. W. H. Guy and F. M. Jacob, Pittsburgh.—p. 233.
*Dermatitis in Association with Disease or Injury of Peripheral Nerves. S. W. Becker, Rochester, Minn.—p. 235.
Vernes Flocculation Test for Syphilis. A. B. Baylis, A. E. Sheplar and W. J. MacNeal, New York.—p. 242.
*Dermatosis Industrialis in Blue Print Worker Due to Chromium Compounds. H. J. Parkhurst, Toledo, Ohio.—p. 253.
*Skin Diseases Due to Emotional Disturbances. H. H. Hazen and E. R. Whitmore, Washington, D. C.—p. 261.
*Ringworm of Scalp; Case in Adult. G. Pernet, London.—p. 267.

Congenital Ichthyosiform Erythrodermia.—Six cases of congenital ichthyosiform erythrodermia are reported by Weiss and Tobias. The earliest time of appearance was at the age of 2 months, the latest at 9 years. In four of the cases, there was a distinct familial tendency. The pathology is similar to that of ichthyosis vulgaris.

Epidermophytosis, Sequel of Vaccination.—Incidental to a recent smallpox epidemic and consequent widespread vaccination, Guy and Jacob have seen thirty-five cases presenting unusual dermatologic sequelae. The history in all cases was practically the same. Subsequent to complete healing (as late as six weeks after healing) there appeared an eruption, beginning in the vaccination scar as an erythematous, slightly scaly spot. After from forty-eight to seventy-two hours, the lesion was sharply marginated, slowly spreading, and the scaling more abundant. Lesions enlarged gradually until they measured from 4 to 8 cm. in diameter. New lesions appeared near the original lesion in about one third of the cases. In one or two cases, confluence of lesions was noted, and in two cases similar lesions appeared in distant parts of the body. The duration varied from four days to three months. Direct examination in twenty cases revealed a fungus, which was successfully cultivated ten times. Two types of organisms were isolated; *Epidermophyton inguinale*, and one which developed a white colony without any pigment formation, which has not as yet been definitely identified. General examination of these patients revealed an interdigital epidermophytosis on the feet in ten cases, and an onychomycosis in one case. Therapeutic agents usually used for epidermophytosis proved effective. Approximately 100 cultural investigations were made of the vaccine lymph supplied by the department of health of the city of Pittsburgh, with uniformly negative results.

Dermatitis Associated with Nerve Injury.—A case is reported by Becker of eczematoid dermatitis of the right side of the face, appearing three weeks after section of the posterior root of the gasserian ganglion. Herpes at no time was suggested. Pyorrhea and dental caries were also present on that side. The condition was little influenced by treatment, and had been present for about four years. Experimental and clinical observations would seem to indicate that toxic, infectious or mechanical irritation of the sensory nerves can be instrumental in producing this type of lesion.

Dermatosis Due to Chromium.—The three cases reported by Parkhurst show that erythematovesicular and small papular dermatitis may follow contact of potassium bichromate with the skin in susceptible persons, and that this dermatitis may be avoided by frequently rinsing the exposed skin with a saturated solution of sodium bisulphite, and then with water.

Skin Diseases Due to Emotional Disturbances.—Hazen and Whitmore assert that many diseases, such as rosacea, may be aggravated by an emotional upset, either as the result of a cutaneous hyperemia or of a disturbed secretion in the gastro-intestinal tract.

Ringworm of Scalp.—Pernet's patient contracted the disease from her 7 year old daughter. A younger brother also became infected. Both these cases were evidently contact infections.

Archives of Internal Medicine, Chicago

36: 150-291 (Aug.) 1925

*Systolic Blood Pressures in Young Men. H. S. Diehl and K. H. Sutherland, Minneapolis.—p. 150.
*Pathogenicity of Trichomonas Intestinalis. H. Tsuchiya, Battle Creek, Mich.—p. 174.
*Primary Vascular Nephritis, or Renal Periarteritis Nodosa. J. J. Keegan, Omaha.—p. 189.
*When Do Lungs Return to Normal Following Exposure to War Gases? A. R. Koontz, Edgewood, Md.—p. 204.
Formaldehyd Poisoning; Fatal Case. B. S. Kline, Cleveland.—p. 220.
*Changes in Heart Rhythm Associated with Cheyne-Stokes Respiration. Displacement of Pacemaker to Branches of Bundle of His. W. H. Resnik and F. W. Lathrop, Baltimore.—p. 229.
*Output of Heart per Beat in Heart Disease. I. M. Rabinowitch, Montreal.—p. 239.
Diseases of Liver. I. A Survey of Tests for Hepatic Function. C. H. Greene; A. M. Snell and W. Walters, Rochester.—p. 248.
Diseases of Liver. II. A Comparative Study of Certain Tests for Hepatic Function in Experimental Obstructive Jaundice. A. M. Snell, C. G. Greene and L. G. Rowntree, Rochester, Minn.—p. 273.

Systolic Blood Pressures in Young Men.—A study has been made by Diehl and Sutherland of the systolic pressures of 5,122 students who entered the university in 1922, 1923 and 1924. In 1922, 16.2 per cent. had systolic pressures of 140 or more; in 1923 and 1924 only 9 per cent. showed this degree of hypertension. In the latter group, only 0.5 per cent. had systolic pressures of 160 mm. or more and 0.1 per cent. of 170 mm. or more. Two hundred and nine students out of 389 who in the 1922 and 1923 entrance examinations showed systolic pressures of 140 mm. or more, were reexamined. Only 15 per cent. of these proved to have persistent hypertension. The calculated proportion of the entire group examined who showed secondary hypertension was 1.2 per cent.; transient hypertension, 5.4 per cent.; intermittent hypertension, 2.8 per cent., and persistent hypertension, 1.6 per cent. Nervousness and excitement seem to be most important factors in the production of transient hypertension in young persons. There seems to be some relationship in this group between overweight and persistent hypertension, but none between vital capacity and hypertension.

Pathogenicity of Trichomonas Intestinalis.—Tsuchiya made chemical and clinical analyses in twenty cases in which *Trichomonas hominis* was found in the feces. Its habitat is the large intestine. Whether present in large or small numbers, neither laboratory nor clinical pictures bear evidence conclusive enough to warrant a pathologic diagnosis. Diarrhea, mentioned by many as characteristic of trichomoniasis, had no clinical aspect in this series; instead, constipation was a common occurrence with no diarrheal history. Furthermore, proctoscopic diagnosis emphasized the fact that constipation is a usual accompaniment in these cases. Nervous symptoms and nutritional disturbances manifested in these cases are attributable not to the presence of *Trichomonas hominis*, but to some organic or functional disorder or to constipation secondary to such. The intestinal flora is independent of the presence of *Trichomonas hominis*. The type of intestinal flora does not alter the number of the flagellates.

Primary Vascular Nephritis.—The case reported by Keegan afforded an unusual opportunity by early nephrectomy and later by necropsy to observe the development of a primary vascular nephritis of infectious origin. The operative specimen presented the characteristic pathologic appearance of periarteritis acuta nodosa, and the necropsy specimen, secured two months later, showed the transformation of this lesion into early arteriosclerosis and chronic vascular nephritis. Associated with this renal vascular pathologic condition was a similar lesion of the cystic artery of the gallbladder, the pancreatic artery and the splenic artery.

Duration of Effect of War Gases on Lungs.—Koontz says that in the great majority of dogs gassed at lethal concentrations no pathologic lesions can be demonstrated from two months to a year after recovery. In a minority of instances, permanent lung damage is done; but this damage is not widespread, is generally confined to small areas, and is generally in the form of small patches of organization, thickening of the bronchial walls with loss of elasticity, or occasional closing of the bronchioles by organized exudate. All such damage will ultimately result in fibrous tissue. This small amount of scar tissue can hardly affect the functional efficiency of the lungs. Since the lungs of dogs are more delicate than those of human beings, it is reasonable to conclude that in the vast majority of surviving human patients, who were not gassed so severely and who receive infinitely better care in hospital, all lesions have disappeared within a short while after gassing, and that the small amount of fibrosis remaining in the minority of cases can hardly be a cause of serious disability.

Changes in Heart Rhythm Due to Cheyne-Stokes Respiration.—Resnik and Lathrop report a case of Cheyne-Stokes respiration in which marked changes in cardiac mechanism occurred at the end of the apneic and the beginning of the dyspneic periods. These changes were: displacement of the pacemaker to the auriculoventricular node and the bundle branches of the main stem of the conduction system; depression of auriculoventricular conduction, and conspicuous slow-

ing of impulse formation at the sino-auricular node. These changes were due to vagal stimulation.

Output of Heart in Heart Disease.—The relative output of the heart per beat was calculated by Rabinowitch from the results obtained by the direct determination of the oxygen content of the arterial and venous blood in ten normal persons and in ten persons suffering from various heart lesions, associated with heart failure. Marked and consistent differences were noted between the values in the normal and pathologic cases in all instances. There appeared to be some general agreement between the clinical picture and the laboratory data.

Archives of Neurology and Psychiatry, Chicago

14: 139-288 (Aug.) 1925

*Spongioblastoma Multiforme. Primary Malignant Form of Brain Tumor. J. H. Globus and I. Strauss, New York.—p. 139.
*Medulloblastoma Cerebelli. Midcerebellar Glioma of Childhood. P. Bailey and H. Cushing, Boston.—p. 192.
Electrical Conductivity of Spinal Fluid. J. L. Eckel, Buffalo.—p. 225.
Mechanism of Immunologic Changes in the Cerebrospinal Fluid. J. A. Kolmer, Philadelphia.—p. 233.
Embryogenesis of Human Cerebrospinal Fluid. W. Hughson, Baltimore. —p. 240.
Cerebrospinal Fluid Pressure; Effects of Solutions of Different Concentrations. W. L. Aycock, Boston.—p. 251.

Spongioblastoma Multiforme.—A primary malignant glioblastic tumor of the brain and spinal cord is described by Globus and Strauss for which the name spongioblastoma is suggested. It presents several distinguishing features: (*a*) It is highly cellular. Its cells are embryonal, incompletely differentiated glial elements—the spongioblasts. (*b*) These cells are found in several, transitional forms, such as the giant cell, the pyriform cell and an irregular stellate cell. (*c*) These cells, particularly the giant cells, frequently undergo amitotic division, although mitotic figures are occasionally encountered. They show marked proliferative tendencies. (*d*) The cells, in their grouping, assume various rudimentary formations, alveolar, radial about cystlike structures, rosets and palisadal. (*e*) Extensive necrotic zones, numerous hemorrhagic foci and cystic degenerative changes are common. (*f*) Grossly, the tumor can be recognized by its granular appearance, marked vascularity, which gives it a dark, dirty brownish-red hue, by the extensive necrotic areas, by marked edema of a wide zone of the neighboring tissue and occasionally by the multiplicity of growth centers. This form of cerebral neoplasm is also characterized by a clinical picture which is marked by acute onset, rapid clinical course and early fatal termination. Because of the atypical clinical features which simulate either an inflammatory or vascular disease of the brain, early diagnosis is exceedingly difficult and often impossible. This form of tumor is occasionally associated with tuberous sclerosis, a form of diffuse spongioblastosis. Such neoplasms are often described under various other names and are frequently called gliosarcoma, a term which is considered incorrect. Sixteen cases are reported.

Medulloblastoma Cerebelli.—Twenty-nine centrally placed cerebellar tumors, arising from above the roof of the fourth ventricle and occurring mainly in children, are described by Bailey and Cushing. For these tumors the term medulloblastoma is proposed. Evidence is submitted that they are composed mainly of indifferent cells, analogous to those described by Schaper in the developing cerebellum, and that most of these cells are potential neuroglia. The surgical experiences indicate that the best method of treatment consists of a suboccipital decompression followed by persistent roentgen-ray therapy.

Boston Medical and Surgical Journal

193: 241-282 (Aug. 6) 1925

*Hypertension and Longevity. H. M. Frost, Boston.—p. 241.
*Influence of Position on Vital Capacity and Percentage of Supplementary Air in Normal Persons and Patients with Large Spleens. F. T. Hunter, Boston.—p. 252.
*Chromaffin Cell Tumor of Suprarenal Medulla (Paraganglioma). I. T. Zeckwer, Boston.—p. 254.
*Infectious Granulomata from Abscessed Teeth. E. M. Daland, Boston. —p. 258.
*Typhus Fever; Case. W. Dameshek, Boston.—p. 260.

Hypertension and Longevity.—Among 146,992 examinations for life insurance, Frost says there were 2,568 cases of hypertension, an incidence of 1.74 per cent. Deducting the cases of transient hypertension (6 per cent.), renal disease (16.8 per cent.) and arteriosclerosis (2.5 per cent.), there remain 299 cases (74.7 per cent.) of hypertension without concurrent evidence of causation, which may be termed "essential." Of these, 237 (79 per cent.) presented additional abnormal signs, single and multiple, such as: heart murmur, 66.9 per cent.; rapid pulse (90+), 38.5 per cent.; hypertrophy of heart, 23.4 per cent., and irregular heart, 9.3 per cent. There was a family history of cardiovascular or renal disease in 28 per cent. The "essential" type of hypertension, in Frost's opinion, represents the initial stages of that cardiovascular degeneration which in time will manifest itself by the signs and symptoms of advanced, probably incurable, hypertensive disease. The only real hope of cure lies in attacking the process at this early stage. This early stage is seen commonly enough by life insurance examiners, but not so often, unfortunately, by the clinician, who is largely concerned with the ill. If these premises are correct, this is a powerful argument in favor of periodic health examination. Systolic hypertension, without other impairment and presumably "essential" in type, is associated with a definite increase in mortality directly proportionate to the degree of pressure elevation; and this mortality is very largely due to the development of circulatory and renal disease.

Influence of Position on Vital Capacity.—Hunter's study of twelve normal persons shows that not only the vital capacity, but also the percentage of supplementary and residual air are greater in the sitting than in the lying position. Measurements of the vital capacity and the percentage of supplementary air were also made in five cases of chronic myelogenous leukemia. The enlarged spleen filled more or less completely the left upper quadrant of the abdomen in four of these patients. In the fifth it was displaced and adherent in the pelvis and extended from the pubes to the umbilicus as a firm rounded tumor. Apparently a large spleen may play a definite rôle in decreasing the percentage of supplementary air, but it does not necessarily cause the low vital capacity which occasionally occurs in myelogenous leukemia.

Chromaffin Cell Tumor of Suprarenal Gland.—The tumor in Zeckwer's case appeared to be a simple tumor of chromaffin cells with no other elements of the suprarenal medulla entering into the tumor process, thus differing from several of those previously reported, in which sympathetic cells participated in the process. The cells were of a quite rapidly growing type, as indicated by their lack of differentiation, irregularity in arrangement, formation of giant bizzare forms and penetration of the cortex. Like all the other reported tumors, it was benign, with no invasion of structures outside of the suprarenal nor production of metastases. The cells, however, had all but penetrated the capsule and their atypical character raises the question whether such a tumor might not become malignant. The association of the tumor with neurofibromatosis is of interest.

Infectious Granulomata from Abscessed Teeth.—Four cases of infectious granulomata are reported by Daland. Three were considered cases of skin cancer. The third patient at one time did have a basal cell carcinoma, but this was removed surgically and what was taken for recurrence was probably an infectious granuloma. All four infections were connected with abscessed teeth and were cured by removal of the teeth.

Endemic Typhus.—Dameshek reports a case typical of typhus fever in the endemic form, known sometimes as Brill's disease. The patient contracted the disease from lice carried over by his parents from Europe.

Colorado Medicine, Denver

22: 259-300 (Aug.) 1925

Head Injuries. C. Gillaspie, Boulder.—p. 262.
Pneumothorax Treatment of Acute Tuberculous Pneumonia. R. J. Groom, Boulder.—p. 264.
Modern Trend in Infant Feeding. G. H. Cattermole, Boulder.—p. 269.
Carcinoma of Stomach; Two Cases. P. R. Farrington, Boulder.—p. 271.
Control of Rickets. H. H. Heuston, Boulder.—p. 274.

Tuberculous Laryngitis from Standpoint of Physician. C. L. La Rue, Boulder.—p. 276.
Acute Abdominal Emergencies. W. W. Reed, Boulder.—p. 281.
Complications of Influenza. W. L. Snair, Louisville.—p. 287.
Case of Vicarious Menstruation Following Artificial Menopause. J. Groom, Boulder.—p. 288.
Interstate Postgraduate Clinic Tour. O. M. Gilbert, Boulder.—p. 289.
Visit to Surgical Clinics and Hospitals of New Orleans. W. W. Reed, Boulder.—p. 291.
New Community Hospital at Boulder. W. C. Huntington, Boulder.—p. 292.

Journal of Cancer Research, Lancaster, Pa.

9: 171-286 (June) 1925

*Regression of Jensen Rat Sarcoma. W. H. Woglom, New York.—p. 171.
Mechanism of Action of Radiation in Treatment of Cancer. K. W. Stenstrom, Buffalo.—p. 190.
*Influence of Certain Limited Diets on Tumor Susceptibility and Growth. K. Sugiura and S. R. Benedict, New York.—p. 204.
Leiomyoma of Pylorus in Black Bear. L. S. N. Walsh, St. Louis.—p. 216.
Cancer of Kidney in Jackal. A. Plaut, New York.—p. 220.
*Experimental Embryomata in Mice. M. T. Burrows, St. Louis.—p. 224.
*Behavior of Coal Tar in Adult and Embryonic Tissue. L. H. Jorstad, St. Louis.—p. 232.
Growth, Hydrogen Ion Concentration, Sugar Fermentation and Surface Tension of Cultures of Pseudomonas Tumefaciens and Pseudomonas Campestris. W. H. Chambers, St. Louis.—p. 254.
*Further Study of Cancer Family. A. S. Warthin, Ann Arbor, Mich.—p. 279.

Regression of Jensen Rat Sarcoma.—Woglom states that comparison of the curves for growing and receding Jensen rat sarcomas shows that the latter fall behind in proliferative energy at about the tenth day. Spontaneous cure seems to be accomplished by the immunity which this sarcoma engenders in its host. Bilateral Jensen sarcomas of the same age pursue a similar course; either both grow or both recede. A knowledge of this fact permits investigation of the early phases of regression. Tumors which are to recede are attacked first at the periphery by some deleterious principle, or condition, associated with the connective tissue of the host. As a consequence, a zone of necrobiosis, followed by what appears to be a secondary fibrosis, sweeps inward from the margin and the neoplasm is thus gradually converted into a fibrous nodule.

Effect of Diet on Tumor Inoculation and Growth.—The susceptibility to tumor inoculation and the growth of such transplantations in rats and mice fed with a diet containing meat, milk or vegetable protein, or an artificial diet free from protein was investigated by Sugiura and Benedict. None of the rations studied influenced the normal transplantability of Flexner-Jobling rat carcinoma or Bashford and Twort mouse carcinoma. The rate of cancerous growth in the hosts was not altered if the diet of the hosts contained over 8 per cent. of protein, irrespective of whether the protein was of animal or plant origin. Ingestion of a protein-free diet caused marked diminution of tumor growth, accompanied by extreme malnutrition of the hosts. The malignant character of cancer cells cannot be influenced by the ingestion of high protein or protein-free diets, or high carbohydrate or low carbohydrate diets. Oral administration of cod liver oil, olive oil, linseed oil and chaulmoogra oil had no influence on the tumor susceptibility and growth.

Experimental Embryoma.—From the observations made by Burrows it is evident that teratomata produced by injecting chopped-up mouse embryos into host mice may persist under the proper conditions, and there seems to be a definite relation between the age of the embryo and the age of the host and this persistence. The younger embryonic tissue persists longer in the hosts than that of older embryos. Hosts which have just passed puberty are more favorable for the persistence of the tumors than younger ones. One animal inoculated with 1⅛ chopped-up embryos when it was 53 days old carried the tumor throughout its life with several pregnancies.

Behavior of Coal Tar in Tissues.—The problem investigated by Jorstad was: How does coal tar produce cancer? It is shown that the primary changes are a movement of fixed tissue cells toward the drops of viscid tar. The tar does not act to stimulate growth but to attract cells to it and away from their blood supply. Growth is a secondary phenomenon which intercedes only when the cells become sufficiently reduced by a pulling away of the endothelial cells of adjacent capillaries. The coal tar acts to attract cells only in that it dissolves the ergusia of the cells. Its action continues until it becomes saturated with this substance. It may then be inactive in the tissue or if conditions are suitable it may migrate into veins which contain little of the ergusia, as any substance containing a surface tension lowering substance may migrate from points in the medium containing a high concentration of the surface tension lowering substance to points of lower concentration of this substance. In the sparsely cellular connective tissue of adults it is very difficult to collect together sufficient cells to produce growth. In the more cellular mesenchyme of embryos more densely cellular masses are easily brought together as they are easily produced in the more cellular epithelial structure of both adults and embryos. This failure to pull cells from the sparsely cellular tissue of adults is not due entirely to the few cells present but to the fact that they become exhausted of their ergusia and degenerate. In a few animals densely cellular masses were accumulated by drops of tar. Tar becomes toxic for the whole animal and leads to cachexia through its ability to thus draw the ergusia to it.

Study of Cancer Family.—The further study made by Warthin of three generations derived from a cancerous great grandfather shows an incidence of 19.18 per cent. of cases of cancer in the 146 individuals comprising the family, and an incidence of 31.81 per cent. of cancer in the eighty-eight adult members of the family. These findings suggest strongly the occurrence of a recessive familial susceptibility to the development of cancer, shown in the males in the gastro-intestinal tract and in the females in the generative organs. The early average cancer age of the affected members, 37.9 years, and the tendency to sudden development and rapid course of the adenocarcinoma types occurring in the family are also notable features.

Journal of Nervous and Mental Diseases, New York

62: 113-224 (Aug.) 1925

*Bismuth Treatment of Cerebrospinal Syphilis. W. A. Smith and L. J. Foster, Ann Arbor, Mich.—p. 113.
Asymmetry of Hemispheres of Brain in Man and Animals. T. Rasdolsky, Petrograd, Russia.—p. 119.
Photographed Lilliputian Hallucinations. E. S. Conklin, Eugene, Ore.—p. 133.
After-Care in Mental Hospital of Erlangen. Kolb, Erlangen, Germany.—p. 141.
Clinical Aspects of Mental Deficiency. I. T. Broadwin, New York.—p. 144.

Bismuth in Cerebrospinal Syphilis.—Smith and Foster believe that bismuth is of value in the treatment of cerebrospinal syphilis. It is especially effective for subjective symptoms. Two cases of multiple sclerosis were treated with bismuth without relief.

Journal of Urology, Baltimore

14: 1-70 (July) 1925

*Studies of Bladder and Ureters. III. Regurgitation of Vesical Contents. R. C. Graves and L. M. Davidoff, Boston.—p. 1.
*Disposal of Ureter in Surgical Excision of Malignant Tumors of Bladder. V. C. Hunt, Rochester, Minn.—p. 19.
Urinary Stasis in Ureteral Obstructions. A. E. Goldstein, Baltimore.—p. 33.
*Sarcoma of Prostate. H. Culver, Chicago.—p. 47.
Prostatectomy: Control of Hemorrhage. F. S. Schoonover, Jr., Fort Worth, Texas.—p. 57.
*Unusual Case of Urethral Calculus. N. P. Rathburn, New York.—p. 59.
Electrode for Use with Young's Punch. Diathermy as Supplement to Prostatic Punch Operation. H. L. Tolson, Cumberland, Md.—p. 63.
Combination Formaldehyd Sterilizer and Cabinet for Storing Sterile Urologic Instruments. R. I. Dourmashkin, New York.—p. 67.

Regurgitation of Vesical Contents.—The belief held by Graves and Davidoff as a result of these studies is that regurgitation from the bladder into the ureters may be accountable for ascending infections of the urinary tract, particularly in cases of vesical neck obstruction.

Malignant Tumors of Bladder.—The frequency with which malignant tumors of the bladder occur following any and all methods of treatment, Hunt says, warrants the frequent reexamination of all patients. Experience has shown that recurrences of even highly malignant growths, when recognized early, respond to treatment. Improvement in results demands

standardization of method of treatment, which is possible only through analysis in terms of the degree of malignancy of the case, and the early application of such standardized methods of treatment as have proved of merit.

Sarcoma of Prostate in Boy.—Culver reports a case of sarcoma of the prostate occurring in a boy, aged 12. The boy died as a result of surgical intervention. Culver suggests conservative treatment, such as cystostomy, to be followed by some form of irradiation.

Urethral Calculus.—Following an attack of infantile paralysis at 7 years, Rathburn's patient, aged 23, was very ill with involvement of both extremities, but with what appeared to be complete paralysis of his bladder sphincter. There was no history of any dysuria or obstruction to the flow. He was in perfectly good health otherwise until four days before admission, when he had a severe chill accompanied by pain and burning referred to the urethra, and diminution in the amount of urine. A suprapubic cystotomy was done in the usual manner. The bladder was enormously thickened and edematous, almost necrotic. The bladder contained about 2 ounces of very foul urine. The bladder and wound were drained as usual. Several incisions were made in the infiltrated tissues, evacuating a large amount of foul urine; one incision over the most prominent part of the swelling through the scrotum and downward into the perineum came on the distal end of a large calculus lying loosely in the tissues, the smaller end engaged in an enormously dilated urethra and apparently extending nearly to the bladder neck.

Laryngoscope, St. Louis

35: 501-578 (July) 1925

New Methods and Apparatus for Testing Acuity of Hearing and Relation of Speech and Tuning Fork Methods. H. Fletcher, New York.—p. 501.
Value of Hearing Tests by Audiometer. J. I. Dowling, Albany, N. Y., and R. L. Wegel.—p. 525.
Potentialities of Audiometer. M. A. Goldstein, St. Louis.—p. 538.
Primary Diphtheritic Otitis Media. J. F. Friesen, Los Angeles.—p. 545.
Case of Atresia of Vocal Cords. G. M. Von Poole, Honolulu, T. H.—p. 548.

Medical Journal and Record, New York

122: 121-184 (Aug. 5) 1925

Psychologic Factors in Hyperthyroidism. N. D. C. Lewis, Washington, D. C.—p. 121.
Carcinoma of Sigmoid Colon Rupturing into Abdominal Wall. W. C. Menninger, Topeka, Kan., and H. G. Holder, San Diego, Calif.—p. 126.
Winter's Mastoids. C. H. Smith, New York.—p. 128.
*Prolapse of Female Urethra. A. Jacoby, New York.—p. 131.
Cultural Methods in Treatment of Chronic Suppurations, Particularly of Bones. Max Thoreck, Chicago.—p. 132.
Interrelationship of Physician and Dentist. M. L. Rhein, New York.—p. 135.
*Ultimate Cause of Most Apoplexies. T. F. Reilly, New York.—p. 140.
Tuberculosis of Hip in Children. H. E. Coe, Seattle, Wash.—p. 145.
Pyloric Obstruction in Infants with Nervous Heredity. R. L. Pitfield, Philadelphia.—p. 148.
Constipation in Infancy and Childhood. H. S. Snyderman, Philadelphia.—p. 150.
Renal, Ureteral and Urethral Calculi; Case. S. Wallenstein, Baltimore.—p. 152.
Treatment of Tuberculous Joints in Children. P. C. Colonna, New York.—p. 155.
Anemia Infantum Pseudoleukemia. S. A. Blauner, New York.—p. 157.
Present Status of Control of Scarlet Fever. R. O. Clock, Pearl River, N. Y.—p. 158.

Prolapse of Female Urethra.—Jacoby's case occurred in a girl, aged 7. The child stated that she was kicked in the vulvar region two weeks before any symptoms were noted. On inspection of the vulvar region, a deeply congested mass was visible occupying the whole space between the labia, overlapping and hiding the hymen. This mass had an irregular longitudinal slit in the center, was slightly eroded at one portion, and was exquisitely sensitive, bleeding readily on being touched with a cotton tipped applicator. Attempts at reduction failed. Operation was performed under general anesthesia. The operation consisted of excising the prolapsed portion and approximating the cut edges by interrupted sutures.

Influenza Causes Apoplexy.—Reilly has found that the signs and symptoms of influenza were almost always present in the mouth and throat of a patient suffering from the brain lesions of apoplexy. Injection of the anterior pillar of the fauces, with injection of the external margin of the ocular conjunctiva and increased temperature are the most constant. Reilly theorizes as follows: During the struggle between the disease and the individual, the blood is surcharged with organisms that are constantly being destroyed. It is quite a reasonable assumption, that finding a diseased vessel, such organisms will lodge there, and that an already degenerated vessel has just such an affinity for them, and particularly is there a chemotactic attraction for them in the lenticulostriate artery. Whether the primary cause of the faulty vessel is arteriosclerotic or syphilitic, there is the same frequency of accompanying head colds.

Medicine, Baltimore

4: 251-343 (Aug.) 1925

Etiology of Scarlet Fever. A. R. Dochez, New York.—p. 251.
Hydrogen Ion Concentration of Blood in Health and Disease. J. H. Auston, Pittsburgh, and G. E. Cullen, Nashville, Tenn.—p. 275.

Military Surgeon, Washington, D. C.

57: 113-224 (Aug.) 1925

Bronchomycoses. A. Castellani.—p. 113.
*Convenient Dressing for Fractured Ribs. J. R. Knowles.—p. 134.
Complement Fixation Tests for Syphilis; Modification of Noguchi Test. C. H. Franklin.—p. 136.
Industrial Mobilization. J. D. Fife.—p. 145.
Present Status of Medical Reserve Corps. D. F. Duval.—p. 153.
*Method for Rapid Examination of Urine at C. M. T. C. and Mobilization Camps. C. W. Field and P. E. McNabb.—p. 158.
Random Notes on Medical Department. F. Conner.—p. 163.
Study of "Cured" Cases of Syphilis in U. S. Army. S. C. Schwartz.—p. 169.
Word Association Test on Hypomanic. I. F. Peak.—p. 181.

Dressing for Fractured Ribs.—In cases of fracture of one or more of the lower ribs and, when the skin is tender and easily irritated by strapping, Knowles applied a Jock strap to be worn upside down. The belly band of the Jock strap must be a good wide one, the wider the better, as long as it does not wrinkle at any point. The strap does not irritate the skin, no matter how much the patient perspires, and, at the same time, holds the rib or ribs in a firm snug position.

Rapid Examination of Urine.—As a result of experience gained in 6,000 urine examinations made at training camps, Field and McNabb have adopted the sulphosalicylic acid test for the initial examination where speed is essential, and the nitric acid test for reexaminations where it is desirable quickly to eliminate from observation all persons who do not show a significant amount of albumin. Approximately 20 per cent. of urines were positive for albumin with sulphosalicylic acid (or with heat and acetic acid) when specimens were collected at the time of the admission physical examination, and approximately 1 per cent. were positive with nitric acid when specimens were collected at reveille.

Nebraska State Medical Journal, Norfolk

10: 281-324 (Aug.) 1925

Athletics and Competitive Athletics Versus Sound Physiologic Principles. I. C. Philbrick.—p. 284.
Modern Aspects of Nutrition. VI. Faulty Food and Bodily Strength. V. E. Levine, Omaha.—p. 290.
Angina Pectoris. W. W. Arrasmith, Grand Island.—p. 294.
Choice of Operation in Peptic Ulcer. L. D. McGuire, Omaha.—p. 297.
Artificial Pneumothorax in Medicine. M. C. Howard, Omaha.—p. 302.
Hemophilia. A. A. Conrad, Crete.—p. 305.
Atypical Tabes Dorsalis: Diagnosis. A. E. Bennett, Omaha.—p. 310.
Progress in Obstetrics. W. C. Becker, Lincoln.—p. 315.

New Jersey Medical Society Journal, Orange

22: 279-322 (Aug.) 1925

Radium Treatment of Carcinoma of Cervix. W. P. Glendon, Bridgeton.—p. 279.
Case of Chondroma of Humerus Necessitating Interscapulothoracic Amputation. W. Spickers, Paterson.—p. 283.
Wood Alcohol Poisoning; Case. C. L. Andrews, Atlantic City.—p. 288.
Meningeal Hemorrhages in New-Born. A. Gordon, Philadelphia.—p. 294.

Rhode Island Medical Journal, Providence

8: 123-140 (Aug.) 1925

Aberrant Thyroid; Two Cases. F. E. McEvoy, Providence.—p. 123.
Acute Appendicitis Occurring in Course of Tubercular Perionitis. A. Converse, Providence.—p. 125.
Tuberculosis of Mesenteric Glands; Associated with Orchitis. R. C. Bates, Providence.—p. 138.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Indian Medical Gazette, Calcutta

60: 301-352 (July) 1925

Cholera in Bengal. A. B. Fry.—p. 301.
*Acquired Diseases of Heart and Aorta in Bengal. U. P. Basu.—p. 307.
*Efficacy of Neembattis in Destruction of Rats and Rat Fleas. C. D. Tiwari and R. B. Lal.—p. 310.
Litholapaxy. R. W. Anthony.—p. 311.
Cellulitis of the Orbit. R. E. Wright and C. G. Taylor.—p. 312.
Art of Indian Chiropodist. R. L. Spittel.—p. 316.
Canine Leishmaniasis in Bombay. R. Row.—p. 317.
*Treatment of Typhus. G. R. McRobert.—p. 318.
*Cellular Elements in Cholera Stools; Relative Importance in Diagnosis. G. C. Maitra, L. B. G. Ganguli and J. B. Basu.—p. 321.
Cultivation of Endameba from Monkey (Macacus Rhesus). M. D. Gupta. —p. 323.
Hemorrhagic Encephalitis After Novarsenobillon Administration; Two Cases. K. Sen.—p. 323.
Rightsided Pleural Effusion Extending into Epigastrium. U. N. Sen. —p. 324.
Choleraic Dysentery. P. K. Kurup.—p. 325.
Kala-Azar with Transposition of Viscera; Case. K. N. Chatterjee.— p. 326.
Aims of Medical Man. C. A. Bentley.—p. 332.

Acquired Heart Disease in Bengal.—Basu analyzes 446 cases of heart disease, so called, seen in Bengal. The cases were classified as follows: pericarditis, 7 cases; arthythmias, 109 cases; angina, 40 cases; dilatation, forty-seven cases; degeneration of the myocardium as the result of heat, poor diet and infections like cholera, dysentery, malaria and kala-azar, 127 cases; acute endocarditis, 28 cases; chronic endocarditis, 35 cases; malignant endocarditis, 43 cases; bradycardia due to high arterial tension, 4 cases.

Neembattis for Destruction of Rats.—A standard neembatti as issued from the Punjab Plague Equipment Depot, Jullundur, is prepared as follows: Potassium chlorate, 2 drams; potassium nitrate, 1½ drams, and sulphur, 2 drams, are powdered together and mixed with 5 drams of oil (any kind, Taramira mustard, castor oil, etc.) to form a paste to which 1 dram of chilli powder (red pepper) and a handful of crushed dried neem leaves (*Azadirachta-indica*) are added. A wick of about 9 inches, made of thick cloth (khaddar) is soaked in a saturated solution of potassium chlorate. This paste is put over the wick leaving exposed about an inch of one end. The wick is then encased in cloth and a piece of thick paper wrapped over it. To use a neembatti, all openings, except one, of the burrow are closed; a neembatti is then ignited and introduced into the open hole which is then similarly closed. Fumigation with neembattis, in the way described, kills the rats and the fleas on the rats in the burrows in the fields in five minutes.

Treatment of Typhus.—In McRobert's experience the most valuable therapeutic measure in typhus fever appears to be the administration of physiologic sodium chlorid solution rectally, subcutaneously and intravenously. Specific serum therapy may be of value, but McRobert's experience with Nicolle's serum has not been encouraging. McRoberts has found that profound mental after-effects are of not infrequent occurrence. Loss of memory, nerve deafness and deficient emotional control are quite commonly found after typhus fever.

Cellular Elements in Cholera Stools.—In a total of 495 cholera cases diagnosed bacteriologically, comma vibrios were found by Maitra, Ganguli and Basu microscopically in 84 per cent. of the stool films. In a total of 496 cholera cases, 92 per cent. showed definite concentration of blood. In 6 per cent. of them the concentration was indefinite and in 2 per cent. there was no concentration at all. Cytologic elements in the cholera stool are constant and characteristic and can be utilized as a reliable index in 98 per cent. of cases.

Journal of Cancer, Dublin

11: 1-48 (July) 1925

Cancer of Uterus. A. C. Magian.—p. 1.
Isolation of Glover Cancer Micro-Organism from Blood and Tissue of Carcinomatous Cases. J. Loudon and J. M. McCormack.—p. 19.
Roentgen-Ray Treatment of Uterine Cancer. Wintz.—p. 33.

Journal of Physiology, London

60: 109-236 (July) 1925

*Effect on Muscle Contraction of Sympathetic Stimulation and of Various Modifications of Conditions. H. Wastl.—p. 109.
Effect of Changes in Venous Blood Pressure on Rate of Flow Through and Gaseous Metabolism of Kidney. E. W. H. Cruickshank and K. Takeuchi.—p. 120.
Relation of Thyroid to Action of Insulin. J. H. Burns and H. P. Marks.—p. 131.
*Conditions of Respiration with the Chest Open. K. Takeuchi.—p. 142.
*Effect of Epinephrin on Respiratory Center. Y. Kuno.—p. 148.
*Production of Anhydremia with Insulin. D. L. Drabkin.—p. 156.
Hem in Nature. M. L. Anson and A. E. Mirsky.—p. 162.
Pulmonary Circulation in the Heart-Lung Preparation. G. V. Anrep and E. Bulatao.—p. 175.
*Relation of Ovarian Function to Menstruation. W. Shaw.—p. 192.
*Relation Between Size of Heart and Oxygen Content of the Arterial Blood. K. Takeuchi.—p. 208.
Double Innervation of M. Gastrocnemius. S. de Boer.—p. 215.
*Helicorubin; Its Relation to Hemoglobin. M. L. Anson and A. E. Mirsky.—p. 221.
*Effect of Pituitary Extract on Secretion and Composition of Urine. R. L. Stehle and W. Bourne.—p. 229.

Effect of Sympathetic on Muscle.—Experiments were made by Wastl to determine whether sympathetic nerve stimulation increased the fatigue contractions of striated muscle but no evidence was found that the sympathetic affects striated muscle, except by modifying the circulation.

Apparatus for Artificial Respiration.—An apparatus is described by Takeuchi by which artificial respiration can be maintained for nine hours or more with the chest open without producing emphysema, and which does not cause more than a trivial decrease in the oxygen saturation of the arterial blood.

Effect of Epinephrin on Respiratory Center.—Kuno states that epinephrin does not cause apnea by constricting the cerebral vessels, but partly by increasing the cerebral blood flow and washing out carbon dioxid, and partly by a direct action on the nerve cells of the respiratory center.

Hypoglycemia Cause of Anhydremia.—Sudden, profound hypoglycemia—the virtual purging of the blood of its sugar—is thought by Drabkin to be the primary cause of anhydremia following on the administration of insulin.

Relation of Ovarian Function to Menstruation.—The histology of the endometrium, the changes in the ovaries in the menstrual cycle, and the relation between the two are discussed by Shaw. The premenstrual changes are first observed about the fourteenth day of the cycle, the cycle being regarded as commencing on the first day of the menstrual discharge. At the end of the menstrual cycle the premenstrual endometrium resembles the decidua of early pregnancy. During menstruation a degeneration of the hyperplastic endometrium occurs which results in the shedding of the superficial portions of the latter. Ovulation in the human female takes place between the thirteenth and seventeenth days of the cycle. The corpus luteum attains its state of maturity on the nineteenth day and persists in its mature form until about the twenty-seventh day. On the twenty-eight day and during menstruation the corpus luteum is degenerate. If pregnancy occurs the corpus luteum persists in its state of maturity until about the twelfth week and the premenstrual changes of the endometrium become better developed to form the decidua. Evidence is brought forward to suggest that the corpus luteum is responsible for the production of the premenstrual changes and of the decidua if pregnancy occurs.

Relation Between Size of Heart and Oxygen Breathed.—Takeuchi found that the reduction of oxygen in the air breathed by a cat produces immediate enlargement of the heart. The readministration produces immediate reduction.

Helicorubin.—The similarities and differences between ordinary hemochromogen and helicorubin are explained by Anson and Mirsky by showing that they contain the same hem but different nitrogen compounds. The nitrogen compound of helicorubin has the greatest affinity for them.

Effect of Pituitary Extract on Urine.—The experiments described by Stehle and Bourne appear to justify the following hypothesis concerning the action of the posterior lobe of the pituitary gland on the secretion of urine: The effects of the active constituent on the secretion of water and chlorid are similar. When either, or both, are being secreted slowly,

pituitary extract causes an increase in the rate or rates; when either or both are being excreted rapidly, it has the opposite effect. Consequently, it may be assumed that the pituitary gland has a definite function in determining the secretion or conservation of water and chlorids, and it may well be that this control is exerted over other constituents of the urine as well. Apparently chlorid and phosphate excretion may be affected in opposite direction by pituitary extract, which is in harmony with the idea of its exerting a general regulatory action. The facts point in the direction of pituitary extract having a general stimulatory effect on secretion under the conditions existing in these experiments.

Journal of Tropical Medicine and Hygiene, London

28: 257-276 (July 15) 1925

*Mixed Mycotic Infections of Bronchi. Mixed Monilia Anaeromyces Infections. A. Castellani, M. Douglas and E. T. Thompson.—p. 257.
Treatment of Cholera and Its Complications. S. K. Ghosh-Dastidar.—p. 261.

Mixed Mycotic Infections of Bronchi.—From observations and researches carried out during the last four years, Castellani, Douglas and Thompson have come to the conclusion that a true mixed monilia plus anaeromyces infection exists, in which each of the two organisms play an etiologic rôle. They base their opinion not on the fact that in these cases both organisms are found in the sputum, as one of them might play only a saphrophytic rôle, but principally on the fact that in such cases the specific treatment for simple bronchomoniliasis (iodids, creosote) and the specific treatment for anaeromyces (anaeromyces vaccine) given alone are not sufficient to induce a cure, while this is obtained by combining the two treatments.

Lancet, London

2: 213-262 (Aug. 1) 1925

Personality, Magic and Medicine. G. M. Robertson.—p. 213.
Disorders of Motility and of Muscle Tone. III. S. A. K. Wilson.—p. 215.
*Acute Intestinal Obstruction. R. L. Williams.—p. 219.
*Vasoneurosis Caused by Toxic Idiopathy to Milk. H. M. Walker.—p. 220.
*Loose Body in Tunica Vaginalis. A. E. Sawday.—p. 220.

2: 263-312 (Aug. 8) 1925

*Relation of Paralysis Agitans to Parkinsonian Syndrome of Epidemic Encephalitis. R. Cruchet.—p. 263.
*Disorders of Motility and of Muscle Tone. IV. S. A. K. Wilson.—p. 268.
*Chronic Upper Abdominal Lesions. G. P. B. Huddy.—p. 276.
Value of Lipiodol in Diagnosis of Bronchiectasis. L. S. T. Burrell and S. Melville.—p. 278.
Treatment of Pseudocoxalgia. G. Perkins.—p. 295.

Acute Intestinal Obstruction Caused by Retained Drainage Tube.—Williams reports a case of intestinal obstruction occurring in a man on whom an appendectomy had been performed twelve years previously. A diagnosis of acute intestinal obstruction, due probably to adhesions or bands following the original operation for appendicitis, was arrived at, and an immediate operation was performed. The region of the old appendicectomy was first explored, but beyond some adhesions between the scar and the great omentum nothing abnormal was discovered. Passing down into the left side of the pelvis from the right iliac fossa a tubular structure not unlike a calcified internal iliac artery was felt. As there was no pulsation it was very cautiously dissected out from its sheath of peritoneum and fibrous tissue, and was found to be a piece of ordinary red rubber drainage tube. On investigation of the pelvis it was discovered that the distal 4 cm. of the tube had passed through an aperture in the lowest part of the root of the pelvic mesocolon. Through this aperture had passed also about 3 feet of small intestine which had become strangulated. The drainage tube measured 15 cm. in length and 1 cm. in diameter, and was in a perfect state of preservation. The remarkable feature of this case is that although the patient had this large drainage tube in his abdominal cavity during the twelve and one-half years that elapsed between the original operation for appendicitis and the operation for acute obstruction, he was nevertheless well, free from abdominal symptoms, and able to work.

Vasoneurosis Caused by Sensitiveness to Milk.—Walker's case shows a general disturbance of the vascular innervation caused by sensitiveness to a foreign protein. By leaving cow's milk out of the diet there have been no further attacks of urticaria, but the sneezing persisted, although not so frequently as before. The association of urticaria, angioneurotic edema, vasomotor rhinitis, and mucous colitis at the same time and in the same case is interesting. It seems probable in this case that the colitis was caused by the same influences which, acting on the skin, had caused the urticaria and, on the nasal mucous membrane, the rhinitis. There is no family history of asthma or vasoneurosis.

Loose Body in Tunica Vaginalis.—The nature of the loose body in Sawday's case was not determined. It was about the size of a pea and might have been a detached cyst of the epididymis or a cystic degeneration of a hydatid of Morgagni or of the hydatid of the epididymis.

Relation of Paralysis Agitans to Parkinsonian Syndrome of Epidemic Encephalitis.—The bradykinetic syndrome in its elementary form is discussed by Cruchet and he shows that the additions found in the parkinsonian and postencephalitic types mark them out as original diseases, perfectly differentiated. From what is known of the diffusion of the encephalitic virus over nervous centers, it is easy to understand that it may give birth in certain cases to the true parkinsonian type—2 or 3 per cent. in Couchet's statistics. But this shows how rare the syndrome is. The association of the parkinsonian and postencephalitic type has been seen in a few cases. But it is only an associated form, which must necessarily be divided into two essential types. That is why, after all, the parkinsonian and postencephalitic bradykinesia must be considered separately.

Disorders of Motility and of Muscle Tone.—Some of the points made by Wilson are: (1) It is *a priori* highly improbable, and contrary to the dictates of common sense, that motor phenomena so conspicuously diverse and of such varying complexity as myoclonus, tremor, athetosis, chorea, tics, bradykinesis, torsion spasm, micrographia, and palilalia should one and all be set down to disorder of striatal function. (2) Consideration of the intrinsic clinical features of some of the motor disorders put down to striatal dysfunction proves that under no circumstances can they be conceived of as resulting from defect or destruction of identical or similar mechanisms, for while some are physiologically of a high order, others are of a low. Wilson's clinical studies have impressed him with the belief that striatal symptomatology and striatal function must be comparatively simple; and that the unwieldy and top-heavy symptom-complex which has gradually come to be erected on the ganglion must be stripped of nonessentials. The corpus striatum is a body one of whose functions is tone control, for in its diseased state tone overdevelops in the skeletal musculature generally; another of its functions is that of inhibiting the physiologically lower function of neuromuscular rhythm, for when it degenerates tremor is prone to make its appearance. In both respects its function is unique and exclusive of that of other centers of approximately the same order.

Familial Tendency in Chronic Upper Abdominal Lesions.—The lesions present in the 311 cases analyzed by Huddy were of four types: chronic gastric ulcer (simple), 95; chronic duodenal ulcer, 129; carcinoma of the stomach, 30; cholecystitis, 57. In every case the diagnosis was definitely confirmed at operation, and, where necessary, by further pathologic investigation. An attempt was made to estimate the existence of a familial tendency in these cases and his findings strongly support the existence of such a tendency.

Practitioner, London

115: 97-164 (Aug.) 1925

Treatment of Insomnia. M. Craig.—p. 97.
Practical Methods of Ultraviolet Rays Dosage. L. Hill and A. Eidinow.—p. 102.
Some Results of Light Therapy. H. C. Semon and M. E. Ormsby.—p. 112.
Artificial Sunlight Treatment. W. J. O'Donovan.—p. 119.
Treatment of Patients Before and After Abdominal Operations. H. J. Paterson.—p. 128.
Fibrositis. J. E. R. McDonagh.—p. 139.
Tonsillectomy Technic by Propulsion and Avulsion. J. B. Horgan.—p. 145.
Operative Treatment of Diseased Tonsils and Adenoids. J. R. Griffith.—p. 150.

South African Medical Journal, Cape Town

23: 269-292 (July 11) 1925

Asthma: An Allergic Reaction. W. Campbell.—p. 270.
Nasal Factor in Causation of Asthma. C. E. Jones-Phillipson.—p. 276.
Etiology and Treatment of Asthma. P. W. J. Keet.—p. 277.
Present-Day Conception of Asthma. D. P. Marais.—p. 279.

Archives de Médecine des Enfants, Paris

28: 401-464 (July) 1925

The Federal Child-Welfare Service at Bahia. M. Gesteira.—p. 401.
*Meningitis of Ascarid Origin. E. Abel and P. Brenas.—p. 426.
Epidemic Encephalitis in Four Months' Infant. Voudouris.—p. 433.
Immunity of Young Infants to Measles. J. Comby.—p. 436.

Meningitis of Ascarid Origin.—Abel and Brenas report from Nancy the case of a boy, aged 7, who developed tetany and grave meningitis, all of which abruptly subsided after expulsion of twelve ascarids under two doses of santonin. The diagnosis at first had been tetanus notwithstanding the initial coma. The blood findings did not seem to indicate toxic action. Both tetanus and meningococcus antiserums had been injected, and a fixation abscess induced, before the passage of an ascarid gave the clue the sixth day of the nervous manifestations. They had been preceded by four days of headache and vomiting at home, with one ascarid in the vomit and two in the stools.

Comptes Rendus de la Société de Biologie, Paris

93: 149-216 (June 26) 1925. Partial Index

*Malaria and Opsonized Quinin. Belonovsky and Balkovsky.—p. 152.
Double Function of Muscle Fibers. J. R. Pereira.—p. 154.
Action of Albuminoids on Chondriosomes. A. Giroud.—p. 158.
*Rôle of the Medulla in Epinephrin Secretion. A. Tournade et al.—p. 160.
*Filtrable Forms of Tubercle Bacillus. F. Arloing and A. Dufourt.—p. 165.
Immunization of Cattle by Toxin of Symptomatic Anthrax. J. Basset.—p. 168.
*Study of the Blood. Chalier et al.—p. 173.
*Staining of Muscle Fibers. M. Favre.—p. 175.
*Iodin in Treatment of Dyshidrosis. M. Favre.—p. 176.
*Cholesterol in Tuberculous Blood. Jullien and Martin-Rosset.—p. 177.
*Ways of Sensitization. Pierret and Gernez.—p. 179.
*Action on Blood Platelets and Leukocytes. Backman et al.—p. 183.
*Lesions from Mushroom Poisoning. Backman and Beskow.—p. 193.
*Concomitant Action of Organ Extracts and Epinephrin. Berggren.—p. 197.
*Guanidin and Vasomotor Action of Epinephrin. Brodd.—p. 203.
*Experimental Habronema Granuloma in Lung. C. Magarinos Torres.—p. 214.

Opsonized Quinin in Treatment of Malaria.—The vein was punctured during the malarial paroxysms, with a syringe containing 2 c.c. of a 50 per cent. solution of quinin, with or without 1 c.c. of spleen extract. The needle was left in the vein for two or three minutes, mixing the contents gently with blood, and then the contents were reinjected into the vein. In twenty grave cases with tertian or quartan paroxysms, three such injections were followed by sudden defervescence, rapid reduction of the size of the spleen, disappearance of the plasmodia, and recovery. Ordinary quinin in these cases was of no avail. No complications followed the injections of this "opsonized" quinin.

Stimulant Action of Medulla Oblongata on Epinephrin Secretion.—Tournade, Chabrol and Wagner's experiments on dogs in artificial symbiosis demonstrated that exposure of the medulla to the action of cocain induced cardiovascular phenomena testifying to an impairment of epinephrin secretion.

Lesions Induced by the Filtrable Tuberculosis Virus.—Arloing and Dufourt found that the lesions from inoculation of the filtrable virus are different from those caused by tubercle bacilli. No visceral or local lesions were manifest. The infection spread exclusively by way of the lymphatics, without causing cheesy degeneration of the glands. The structure and staining properties of the bacilli present in the lymphatics closely resembled those of the usual tubercle bacilli.

Relations Between the Refraction Index, the Viscosity and the Protein Content of the Blood.—The findings in Chalier, Boulud and Chevallier's research in fifty-three persons on the total of proteins in the blood serum, as shown by the method of weighing, agreed with that determined with the refraction index. Consequently, they say, the latter method may be clinically utilized. No connection could be established between the viscosity of the blood and the protein content. Estimation of the viscosity seems to indicate the nature of the proteins rather than their quantity, since pronounced viscosity frequently coexists with a low protein content.

Technic for Staining Smooth Muscle Fibers.—Favre gives a detailed description of his method, which applies not only to normal muscles but also in pathologic conditions, especially in cases of uterine fibromyoma.

Iodin in Treatment of Suppurating Dyshidrosis.—Favre used applications of tincture of iodin (20 c.c. of iodin and 10 c.c. of alcohol) with subsequent dressings of linimentum calcis in cases of extensive cheiropompholyx with large vesicles, tending to suppuration. Under this treatment the eruption, as well as the associated functional disturbances of the extremities, rapidly improved. The efficacy of iodin seems to confirm the parasitic origin of the disease.

The Cholesterol of the Blood in the Tuberculous.—Measurement of the cholesterol in the blood serum of twenty-four patients with different forms of tuberculosis showed that the amount is not modified under the influence of the infection.

Anaphylactic Sensitization.—Pierret and Gernez' research on guinea-pigs with horse serum proved that anaphylactic sensitization may be induced with intradermal injections as well as with epidermic and subcutaneous applications. With the latter, the sensitization seemed to be more complete.

Action of Certain Salts on Blood Platelets and Leukocytes.—Backman and his co-workers noted that intravenous injections of calcium chlorid or of sodium citrate induced in rabbits a transient reduction of the number of blood platelets. While with calcium the number of leukocytes increased, there was a considerable decrease under sodium citrate. Injections of physiologic salt solution did not affect the number of blood platelets or of leukocytes in the animal. Under epinephrin the platelets increased in numbers, while the number of leukocytes was unchanged or increased. With histamin the platelets increased in numbers; with nicotin they decreased. Acetylcholin increased the number of platelets, but did not modify that of the leukocytes. Even toxic doses of pilocarpin did not influence the platelets, and only slightly increased the number of leukocytes. Atropin caused a marked diminution of the number of platelets, and increase of leukocytes.

Fatal Lesions in Mushroom Poisoning.—Backman and Beskow conclude from experimental poisoning of rabbits with fly agaric that death in these cases is due to changes in the bone marrow.

Enhancement of the Action of Epinephrin by Certain Organ Extracts.—An extract of rabbit lymph glands seemed to enhance the constrictor action of epinephrin on the uterus; in the intestine, the extract increased simultaneously the constrictor and the inhibiting action of epinephrin. The same occurred with muscle and blood extracts. The action was probably due to certain chemical substances contained in the tissues, and only slightly to the amino-acids present.

Effect of Guanidin Derivatives on the Vasomotor Action of Epinephrin.—Brodd found that creatin and arginin increase the vasoconstrictor property of epinephrin, although dilating the vessels. This may be explained by the action of these substances on the motor nerve terminals of the sympathetic. Creatinin seemed to lack this property.

Tropism of Habronema for the Lungs.—Magarinos Torres observed that larvae of habronema, applied to a wound in guinea-pigs, migrated to the lung, forming there a granuloma. He points to this experience as confirming the specific affinity of the worm for the lung. It reaches the lung by way of the blood vessels as well as by the mouth and nose.

Journal de Chirurgie, Paris

25: 633-772 (June) 1925.

*Reconstruction of the Esophagus. J. Jankovskis.—p. 633.
*Sympathectomy in Gynecology. G. Cotte and M. Dechaume.—p. 653.

Total Esophagoplasty.—Jankovskis reports from Riga, with illustrations, four cases in which the entire esophagus was

reconstructed, with excellent functional results. In a fifth case of lye stenosis the patient succumbed to pleural empyema after mere esophagostomy. The patients were all young adults, and the new subcutaneous esophagus was made from a 40 cm. segment of the jejunum. He enclosed it in a skin tube extending above and below the suture points. The whole procedure took about a year and a half, but it restored the earning capacity more or less completely and the enjoyment of life.

Gynecologic Periarterial Sympathectomy and Resection of Presacral Nerve.—Cotte and Dechaume refer to decortication of the hypogastric artery or section of the presacral nerve in treatment of rebellious dysmenorrhea or pelvic neuralgia, vaginismus, hypoplasia of the uterus of probably mild infectious origin, clitoris crises and metrorrhagia and leukorrhea of ovarian origin in young girls. In twenty of their thirty-six cases the ovaries were partially resected at the same time, and the uterus was removed in two. To date there has been no recurrence of the disturbances for which the operations were done. They have now abandoned the operation on the artery, and for the last ten months have resected the presacral nerve through a laparotomy as even more effectual, while the technic is simple and rapid. The prevertebral sympathetic gangliated cord continues its downward course along the inner side of the last lumbar vertebra, forming what they call the presacral nerve, often visible through the peritoneum. The resection is done a little above the promontory, before the nerve divides.

Presse Médicale, Paris

33: 1009-1024 (July 29) 1925

*Achievements of the Paris Physiology Laboratory. C. Richet.—p. 1009.
To Close a Gastro-Enterostomy. V. Pauchet.—p. 1012.
*Experimental Cancer of the Gallbladder. J. Rouillard.—p. 1014.

The Scientific Work of Charles Richet.—Richet summarized in his farewell lecture his work as chief of the laboratory of physiology at the Paris Medical School for nearly half a century. He described how various discoveries were made with the aid of his co-workers. In 1884 he demonstrated that "thermic polypnea" is a phenomenon for protection of the organism against overheating, and that the panting may be of central as well as of reflex origin. Subsequently he proved that a fit of shivering is also a phenomenon for heat regulation, and it can be central or reflex in origin. He recalled that he was the first to establish the principle of serotherapy, reporting in 1888 that the injection of blood from an immunized animal confers immunity on a nonimmunized animal. The first therapeutic injection of an immune serum (from tuberculized dogs), in man, was made by him in 1890. In 1900 he suggested the treatment of tuberculosis with raw meat juice. Observation of 300 tuberculous ex-soldiers treated with the juice of desiccated meat in 1916 confirmed, he said, its efficacy, if it is used in the beginning of the disease and in adequate doses. He styled this zomotherapy the specific organotherapy for the muscles, the ancestral tissues assimilating raw juice better than the cooked. He mentioned further his research on lactic fermentation, also on the persistence of acquired properties in organisms. Speaking of his discovery of anaphylaxis in 1902, he traced it to his experiments on the physalia, marine organisms, made on the yacht of the prince of Monaco, and his experiments on sea anemones. He remarked that the Index Catalogue, as early as 1922, had listed 3,500 articles on the subject of "Anaphylaxis."

Experimental Cancer of the Gallbladder.—Combining different statistics, Rouillard asserts that 10 per cent. of persons harbor gallstones, while 5 per cent. of this group develop cancer in the gallbladder. Gallstones seem to be always found with cancer of the gallbladder. He refers to Leitch's experiments in which calculi, introduced into the gallbladder of guinea-pigs, were followed by formation of a cancer. Certain of the findings appeared to be similar to those in cancer of the gallbladder in man. The chronic irritation of the mucosa, caused by the calculi, may create characteristic lesions of the precancer phase, with consecutive epithelioma. "Cancer does not start in sound tissue."

33: 1025-1040 (Aug. 1) 1925

*Consequences of Gastritis. F. Ramond.—p. 1025.
*Spasm of the Central Artery of the Retina. C. Abadie.—p. 1026.
Radiology in Pulmonary Tuberculosis. L. Dioclès.—p. 1029.

Chronic Gastritis in Pathogenesis of Ulcer and Cancer of the Stomach.—Ramond believes that ulcers as well as cancer of the stomach develop from chronic gastritis, with defective emptying of the stomach. Prolonged sojourn of the chyme in the stomach, and subsequent growth of the bacteria retained in the gastric crypts is the first phase of the pathologic process. The local infection provokes a reaction of the mesodermal cells, with metaplasia. Treatment of chronic gastritis should aim to restore normal conditions of evacuation.

Spasms of the Central Artery of the Retina.—On the basis of two recorded observations and one personal, Abadie asserts that spasms of the central artery of the retina are not rare. The affection is often mistaken for embolism of the artery when restricted to one eye. With spasm of the artery the fundus of the eye is not modified; with spasms of long standing, atrophy of the optic nerve with loss of sight may occur. But the perception of light still persists with the spastic or essential atrophy. While a bilateral spastic atrophy may be easily differentiated from the atrophy with neuritis or atrophy of intracranial origin, the differentiation from tabetic atrophy may be more complicated. The sudden appearance of the affection, and the persistence of the reflex to light may indicate the spastic origin of the atrophy. An immediate and remarkable improvement may be obtained with daily intra-orbital injections of 20 drops of a solution containing 0.001 gm. of atropin. The injections may be occasionally repeated, and atropin be given by the mouth, three times a day, to a daily dose of 0.001 gm. In a case observed, the improvement has persisted for a year. This treatment is also efficient in atrophy of the optic nerve from quinin poisoning, since the atrophy here is also of a spastic nature. Spasm of the central artery of the retina is closely related to the arterial spasms in Raynaud's disease, and to the spasms of the coronary arteries in angina pectoris.

Schweizerische medizinische Wochenschrift, Basel

55: 681-704 (July 23) 1925

Emboli in the Skin After Injection of Bismuth. W. Brack.—p. 681.
*The Disturbances in Calcification in Rickets. E. Glanzmann.—p. 683.
Dangers from Prolonged Immobilization of Joints. Debrunner.—p. 692.
Hay Fever with Pneumonia and Phlebitis. A. Goenner.—p. 696.

Experimental Studies in Rickets.—Glanzmann kept rats on McCollum's diet which regularly produces rickets. On these rats he tested the antirachitic action of certain foods. He believes that the most important factor in the pathogenesis of rickets is the ratio between the calcium and the inorganic phosphorus in the blood, which is normally 1.95:1. McCollum's diet does not contain enough phosphorus. If the phosphorus is increased without the addition of calcium, or if the calcium is reduced in this diet, rickets does not develop. An excess of calcium in the diet results in a lowering of the inorganic phosphorus and in rickets. Glanzmann was not able to find that vegetable vitamins prevent rickets; vegetables like other foods, fresh or autoclaved, have an antirachitic action when they contain compounds (lecithin, potassium salts) which correct the disturbed calcium-phosphorus ratio in the blood. Consequently it was found that vitamin-free ovolecithin or vitamin-poor beef (which reduces the excretion of the phosphoric acid through the intestines) had a very efficient antirachitic action. That overfeeding with cow's milk predisposes children to rickets may be explained by the high calcium carbonate content (which lowers the phosphorus percentage in the blood), by the high protein content which leads to an increased excretion of phosphorus, and by the fact that the fats in milk have not the same protective quality against the rachitic factors in milk as the fats in cod liver oil, for example. The regulation of the blood phosphorus is especially dependent on the liver (which discharges continually phosphorus-containing fats into the blood stream), on the pancreatic islands (insulin decreases the phosphorus content in the blood), and on the parathyroids (removal of the parathyroids increases the phosphorus content of the blood). Irradiation of rachitic rats (Hess) results in an increase of phosphorus in the blood.

Clinica Pediatrica, Modena

7: 321-384 (June) 1925

*Sweating in Infants. A. B. Marfan.—p. 321.
*Subcutaneous Emphysema of Pulmonary Origin. C. L. Cattelan.—p. 332.
Fatal Jaundice-Ascites-Nephritis Syndrome in a Child. G. Bentivoglio. —p. 355.

Connection Between Sweating and Pyodermatitis in Infants.—Marfan urges the necessity for guarding infants against sweating, as this invites suppurative skin affections and perpetuates them. Artificial feeding and rickets are responsible for excessive sweating, and the main indications in pyodermatitis is a change to breast feeding and means to combat the rickets. Local measures are futile unless the tendency to excessive sweating can be overcome.

Spontaneous Pneumothorax in Children.—Ten cases are described by Cattelan in which the gases in stomach or bowel found their way into the subcutaneous tissue from trauma, or perforation of a destructive process, or from spasmodic coughing. One boy, aged 3, in the course of measles with whooping cough developed tympanism in the chest, compelling puncture of the pleura. The subcutaneous emphysema spread all over the head and trunk. The pressure had ruptured not only alveoli but the pleura, and the bilateral pneumothorax contributed to the fatal outcome. Tuberculosis was manifest in seven of the ten cases.

Giornale Ital. di Derm. e Sifilologia, Milan

66: 1025-1172 (June) 1925. Partial Index

*Herpes Zoster with Syphilis. M. Artom.—p. 1044.
Roentgenotherapy in Itching Eczema. R. Porcelli.—p. 1114.
*Bromids by the Vein in Pruritus. C. Felugo.—p. 1120.
*Extragenital Primary Chancres. F. Ronchese.—p. 1123.

Herpes Zoster in Syphilis.—Artom describes two cases in which herpes zoster developed in the course of neurosyphilis; another two in tabes, and two in general paresis. The onset always corresponds with a flaring up of the syphilitic process. One tabetic had herpes zoster on the chest when gastric crises first developed, and had another attack, two years later. The zoster was restricted to the neck this time, as symptoms of cerebral syphilis became manifest.

Bromids by the Vein in Dermatology.—Felugo reports excellent results from intravenous injection of sodium or calcium bromid in rebellious cases of pruritus, evidently a true sensory neurosis of the skin. It benefited also in Hegar's prurigo. There were no untoward by-effects, but the outcome was disappointing in his twenty cases except so far as the pain and itching were concerned.

Extragenital Primary Chancres.—Ronchese found multiple chancres in 156, that is, in 7.4 per cent. of his 1,132 cases of initial syphilis. The primary lesion was extragenital in ninety-four cases (thirty-three men).

Pediatria, Naples

33: 737-800 (July 15) 1925

*The Measles Virus. G. Salvioli.—p. 737.
*Epinephrin in the New-Born. C. Gallo.—p. 745.
*The Fourth Symptom of the Hutchinson Triad. A. Oro.—p. 751.
*The Weiss Reaction in Tuberculous Children. G. Roi.—p. 762.
Three Unusual Cases of Diphtheria. Sindoni and Guccione.—p. 773.
*Etiology of Epidemic Encephalitis. M. Misasi.—p. 781.

Research on the Caronia Measles Virus.—Salvioli used Di Cristina's citrated broth medium to make cultures from the blood in thirty-six cases of measles. The positive results in fourteen confirmed Caronia's statements. His technic differed from Caronia's in many respects, especially the smallness of his doses in vaccination, and eleven of the thirteen infants vaccinated with the cultures developed measles in spite of the vaccine.

Effect of Epinephrin on the New-Born.—Gallo's tabulation shows that an intramuscular injection of 0.5 gm. of the 1:1,000 solution of epinephrin almost regularly increased the leukocytes by 2,000 to 5,000. He ascribes this to an action on the peripheral vessels.

Joint Lesions in Congenital Syphilis.—Oro asserts that chronic hydrarthrosis is a more common manifestation of congenital syphilis than deafness. The Hutchinson triad should be amended to include it, or the triad should be a quadrad. In eleven cases he describes, the knee was the joint affected, but in two the elbow and shoulder had been previously involved. There was otitis media in eight of the eleven subjects. In all the joint disturbances promptly disappeared under specific treatment for syphilis. The hydrarthrosis may not develop until adult life. The tenderness of the swollen joint and the aggravation at night should suggest the diagnosis.

The Urochromogen Reaction in Tuberculous Children.—The findings were never positive in eighteen of twenty children with tuberculous bronchial glands, and they became negative in the two others as the tuberculin test veered to negative.

Etiology of Epidemic Encephalitis.—Misasi reviews the international literature, remarking in conclusion that the Americans, Strauss, Loewe and Hirschfeld, and the Italians, Maggiore and Sindoni, have nearly, if not entirely solved the problem. The Italians regard epidemic encephalitis as the same disease as epidemic poliomyelitis, differing only in the organs affected by the filtrable virus. They have found the vaccines and antiserums interchangeable.

Rivista di Clinica Pediatrica, Florence

23: 433-504 (July) 1925

*Basal Metabolism in Tuberculous Children. C. Cisi.—p. 433.
*Correlations of Hormones. A. Cabitto.—p. 462.
*The Intradermal Test for Malta Fever. G. Sorge.—p. 471.

The Basal Metabolism in Tuberculous Children.—Cisi tabulates the findings in forty-nine children, some examined more than once. The basal metabolism was normal in 79.5 per cent.; above normal in 16.3 per cent., and below in 6.2 per cent.

Correlation of Hormones.—Cabitto studied this subject by the action of extracts of different organs on the frog eye.

Intradermal Test for Malta Fever.—Sorge found this test unreliable. There was a positive reaction in 80 per cent. of the fifteen Malta fever cases, but also in nearly 30 per cent. of the eighty-six patients with other affections.

Lisboa Médica, Lisbon

2: 177-228 (April) 1925

Insulins. Fernando Fonseca.—p. 177.
Subphrenic Gas Abscess with Eventration of the Diaphragm. Armando Narciso.—p. 184.
Pancreatic Cyst in Adult Male. J. H. Cascao de Anciães.—p. 198.
*Primary Tuberculosis of Muscle. Casimiro Afonso.—p. 212.

Primary Tuberculosis of Muscle. — Casimiro Afonso describes a case of a tuberculous process in the vastus internus in a young woman. He comments on the difficulty of differentiating a tuberculous from a syphilitic process in the muscle. With a gumma, there is considerable vascularization and a tendency to fibrous transformation, rendering delimitation difficult between the gumma and the surrounding tissues, contrary to what is observed in tuberculosis. The patient had synovitis in the forearm which had clinically preceded the muscular tuberculosis. The lesion was resected.

Memorias do Instituto Oswaldo Cruz, Rio de Janeiro

17: 229-399, 1924. English and French Translations

Flagellate Parasites of the Cavy. G. Hasselmann.—p. 229.
Study of the Scorpions of Brazil. O. de Mello Campos.—p. 237.
The Helminth Fauna of Brazil. XVII. L. Travassos.—p. 365.
Helminthiases of Children in State of Paraná. de Souza Araujo.—p. 389.

Prensa Médica Argentina, Buenos Aires

12: 97-128 (June 30) 1925

*Pylorus Insufficiency. Bonorino Udaondo and Sanguinetti.—p. 97.
*Urticaria and Dermographism. Castex and Camauer.—p. 103.
Provisional Prostheses. N. Tagliavacche.—p. 113.
*Balantidiasis in Argentina. F. L. Niño.—p. 114.

Insufficiency of the Pylorus as an Aid in Diagnosis.—This study of pyloric insufficiency emphasizes the nervous factor which may be entirely or partially responsible for the symptoms. Not only ulcer or tumor in the stomach or duodenum may be responsible for the obstruction, but it may be secondary to remote lesions, chronic appendicitis, tuberculous

peritonitis or disease in the biliary apparatus. With insufficiency of the pylorus secondary to a cancer or ulcer, surgical measures should always be tried, even if resection is not possible, in order to free the sphincter from the adhesions which impede its function.

Urticaria and Dermographism.—In this tenth instalment of their study of the clinical manifestations of the sympathetic system, Castex and Camauer report some cases which show its intimate participation in itching dermatoses, and in dermographism. In some of the cases there seems to be complete anarchy in the vegetative sphere.

Balantidiasis in Argentina.—The young woman with grave colitis from infection by the balantidium had always resided in Buenos Aires. It is the third case to be published in Argentina.

Deutsche medizinische Wochenschrift, Leipzig

51: 1223-1264 (July 24) 1925

The Surgical Treatment of Endocrine Disturbances. E. König.—p. 1223.
Pressure-Relieving Operations. E. von Hippel.—p. 1225.
Vaginal Versus Rectal Examination by Midwives. Reifferscheid.—p. 1229.
*Artificial Pneumothorax and Erythrocytes. Dünner and Mecklenburg.—p. 1231.
Serodiagnostic Methods for Syphilis. W. Schöndorff.—p. 1231.
Prevention of Diagnostic Blunders. S. Kalischer.—p. 1233.
*Paratyphoid Cholecystitis. A. Löwenthal.—p. 1234.
Prophylaxis of Acidosis. P. Ziegelroth.—p. 1236.
The Pancreatic Ferment in Dermatologic Therapy. P. Zadik.—p. 1236.
Intense Serum Sickness in an Adult Male. H. Vollmer.—p. 1237.
Iodin Spray for Local Use. Hennicke.—p. 1238.
Needle for Transfusions. O. Ansinn.—p. 1238.
Instrument to Obtain Secretions in Gynecologic Practice. E. Guttmann.—p. 1239.
Recent Works on Infectious Diseases. O. Moog.—p. 1239.
*Infant Mortality in Berlin, 1924. C. Wiese.—p. 1240.
The Hygiene Institutions in Palestine. Canaan.—p. 1242.
Changes in the Social Insurance. E. Scholz.—p. 1242.
Gratuitous Treatment of Physicians. Hanauer.—p. 1243.
Medical Health Insurance Companies. O. Salomon.—p. 1243.
The "Thousand Years Exposition" at Cologne. W. Haberling.—p. 1244.
Medicine and the History of Art. Vorwahl.—p. 1245.
Virchow and Frerichs in the Fight Against Nostrums. Schwalbe.—p. 1245.
Homeopathy. E. Müller.—p. 1246. Conc'n.

Artificial Pneumothorax and the Erythrocytes.—Polycythemia does not follow pneumothorax treatment, because the other lung provides for the respiratory requirements. Dünner and Mecklenburg have demonstrated that patients with a completely collapsed lung are perfectly normal as to respiratory volume, oxygen absorption, carbon dioxid expiration, and the pulse rate. Findings on dogs may lead to erroneous conclusions, because the dog has a perforated mediastinum, and pneumothorax is therefore almost always bilateral.

Paratyphoid Cholecystitis.—Löwenthal reports two patients (husband and wife) who were operated on for cholecystitis. In both cases the paratyphoid B bacillus was found in the bile. Both recovered after cholecystotomy.

Infant Mortality in Berlin.—The mortality of legitimate infants rose during the war, but returned to prewar figures in 1920. The mortality of illegitimate infants, however, rose particularly after the war and reached 307-330 in 1,000 living born during 1920-1922 (as compared to 194 in 1913). Wiese believes that the depreciation of the mark is responsible for this rise. (See Berlin Letter on page 761.)

Deutsche Zeitschrift für Chirurgie, Leipzig

191: 321-413 (July) 1925

*Cancer of the Colon. H. Porges.—p. 321.
*Mastitis. Walzel-Wiesentreu and F. Starlinger.—p. 336.
Cerebral Tumors. L. Schönbauer.—p. 343.
Kirschner's Bone Suture. A. Winkelbauer.—p. 353.
Amyloid Goiter in Man of 52. P. Moritsch.—p. 361.
Injuries to Recurrent Nerve in Goiter Operations. Schneider.—p. 369.
Primary Sarcomas of the Small Intestine. E. Koch.—p. 376.
Volvulus in an Incarcerated Hernia. L. Tseng.—p. 390.
Pseudotumor of the Bone. M. Wülfing.—p. 397.
The Lymphatic Glands of the Lower Extremities. Most.—p. 408.

Surgery of Cancer of the Colon.—Porges reports the operative technic, the symptomatology, and the results in 312 cases from Hochenegg's clinic. A merely exploratory operation was done in 18 cases; in 72 cases, colostomy; in 50, an anastomosis, and in 172 cases, or 55 per cent., a radical operation was performed. Of the latter group of 172 patients, 28 per cent. survived for at least three years without metastasis or recurrence; seven for ten years. The method of choice for tumors on movable parts is the two-stage operation. Tumors of the cecum or the hepatic flexure are resected in a one-stage operation. The three-stage method is used only when special conditions make it imperative.

Mastitis.—Walzel-Wiesentreu and Starlinger reexamined ninety-eight women who had been treated for mastitis during a recent twenty year period (total 1,456, but only ninety-eight could be traced). In no case did they find cancer in the mamma. Multiple radial incisions yielded poor results as to permanence of the cure, function and disfigurement. The method of choice is incision with a spherical cautery in a circumscribed abscess formation. With diffuse interstitial mastitis, the treatment advocated by Bardenheuer is followed.

Klinische Wochenschrift, Berlin

4: 1433-1480 (July 23) 1925

Homeopathy, Logic, and the Emotional Complex Associated with a Mental State. Heubner.—p. 1433. Conc'n. See Berlin Letter, p. 761.
*The Action of Ergot on the Sympathetic Nerve. E. Rothlin.—p. 1437.
Experimentally Induced Sympathicotonia. Wohlgemuth and Seo.—p. 1443.
Agglutination and Sedimentation of Erythrocytes. G. H. Schneider.—p. 1445.
*Hormones in Vitamin Deficiency. J. Serebrijski et al.—p. 1447.
Case of Bismuth Exanthema. Holzamer and Schultze-Heubach.—p. 1448.
Interstitial Pregnancy. K. Hellmuth.—p. 1451.
Treatment of Intertrigo in Infants. E. Poeck.—p. 1453.
*Immunization Against Diphtheria by Mouth. W. Pockels.—p. 1454.
*Potassium Ions and Insulin Action. E. Kylin.—p. 1455.
Tar Sarcomas in Mice from Intraperitoneal Injection. Löwenthal.—p. 1455.
Bilateral Renal Tuberculosis. W. Hofmann.—p. 1456.
Congenital Syphilis. O. Mergelsberg.—p. 1457.
*Tuberculosis Mortality and Industrialization. G. Wolff.—p. 1459.

The Ergot Alkaloid.—Rothlin studied the pharmacodynamic action of the ergot alkaloid on isolated organs, and found that it paralyzes selectively all the sympathetic nerve endings. The same antagonism that exists between the action of pilocarpin and atropin for the parasympathetic nerve endings exists between epinephrin and the ergot alkaloid.

Hormones in Rats on a Vitamin-Free Diet.—It is well known that in rats which have become rachitic as a result of vitamin-free feeding, the phosphorus content of the blood is low. Serebrijski, Vollmer and Zadek injected such rats with extracts from the thymus, the ovary, and from the pituitary. These rats secreted less acids in the urine than the controls, their blood phosphorus was normal, but the rachitic condition remained uninfluenced.

Immunization Against Diphtheria by the Mouth.—Pockels treated 100 Schick-positive children with toxin-antitoxin mixture by the mouth, and found that after this procedure (how long after is not stated), ninety-one of these children were Schick-negative. But it appears that this immunity is retained for a short period only.

Ions and Insulin Action.—Kylin found that the potassium ions enhance and the calcium ions reduce the effect of insulin on the blood sugar.

Tuberculosis Mortality and Industrialization.—Wolff shows with a large statistical material that the tuberculosis mortality rate is considerably lower in densely populated, industrialized districts, such as England or Saxony, than in the much less highly civilized alpine districts of Bavaria and Austria and in the steppes of Hungary.

Medizinische Klinik, Berlin

21: 799-838 (May 29) 1925

*Metabolism of Minerals. C. Hirsch.—p. 799.
*Diagnosis of Intraperitoneal Extravasation. Vogt.—p. 804.
*Hemorrhage and Anemia in Syphilis. Citron and Hirschfeld.—p. 805.
*Adolescent Mothers. K. Jaroschka.—p. 808.
*Etiology of Vesicular Mole. A. Haas.—p. 811.
*A Peculiar Form of Influenza. E. Bernheim.—p. 811.
*Jaundice of the New-Born. H. Slobosiano and P. Herscovici.—p. 813.
Predisposition or Exposure to Tuberculosis. Liebermeister.—p. 814.
Treatment of Tuberculous Peritonitis. A. Fritz.—p. 814.
*Indicanemia and Insufficiency of the Kidneys. O. Klein.—p. 816.
Connection Between Trauma and Death from Tuberculosis. von Schnizer.—p. 820.
Recent Works on Bronchial Asthma. G. Noah.—p. 823. Conc'n.
Social Medicine at Spas. F. Grünbaum.—p. 837.

Metabolism of Minerals.—Hirsch reviews the physiology and pathology of the mineral metabolism, with especial regard to plants.

Diagnosis of Intraperitoneal Extravasation by the Sense of Smell.—Vogt noticed a peculiar odor of the whole body and the tissues in grave intraperitoneal hemorrhages. He points to Bätzner's investigations which demonstrated the toxicity of the residual blood from animals that were bled to death. The odor may be due to some products present in the blood of such women.

Hemorrhagic Diathesis and Anemia in Treatment of Syphilis.—Citron and Hirschfeld emphasize the necessity for interrupting immediately the antisyphilitic treatment when signs of a hemorrhagic diathesis or anemia appear.

Childbirth in Adolescents.—Jaroschka publishes statistics on 239 cases of labor in girls from 13 to 17 years of age. The disadvantages for the mother and child seem to be very slight, he says.

Etiology of Vesicular Mole.—Haas observed three times a hydatidiform mole in the same patient. She had enlarged polycystic ovaries, resembling histologically folliculomas. This patient's sister had also a mole.

Peculiar Form of Influenza.—Bernheim reports on a few instances of attacks of severe pains in the muscles, especially of the right epigastrium. The temperature was normal. He regarded the condition as an influenzal myositis.

Cinchophen in Jaundice of the New-Born.—Slobosiano and Herscovici gave 0.1 gm. of cinchophen (with or without 2 gm. of sugar) daily to the new-born infants with jaundice. The jaundice disappeared in twelve days in 80 per cent. of the sixty-seven treated with cinchophen.

Indicanemia and Insufficiency of the Kidneys.—Klein found a discrepancy between the high residual nitrogen and the low indicanemia in acute glomerular nephritis, in diabetic coma, and in grave insufficiency of the kidneys. Anomalies in the cleavage of proteins may be assumed in all of these cases.

Monatsschrift für Geb. und Gynäkologie, Berlin

70: 1-120 (July) 1925

*The Fetal Hormones. W. Lüttge and W. v. Mertz.—p. 1.
The Blood Proteins During Gestation. L. Kraul.—p. 6.
*Injury of Child by Intra-Uterine Intervention. G. Winter.—p. 12.
Frontal Presentation. K. Fink.—p. 29.
Folds in Scalp of New-Born. K. Volkmann.—p. 36.
Amnion Hydrorrhea. H. R. Schmidt.—p. 44.
Etiology of Retroflexion of the Uterus. Hochenbichler.—p. 56.
*Castration and Ovarian Deficit Phenomena. Wolmershäuser.—p. 63.
Neurologic and Psychiatric Indications for Sterilization of Women. E. Meyer.—p. 79.
Resorption Treatment of Chronic Gynecologic Affections. M. Sserdjukoff.—p. 86.
Case of Carcinoma of Bartholin's Gland. K. Neuwirth.—p. 93.

The Fetal Hormones.—Lüttge and von Mertz reiterate that blood from the umbilical vein of a male infant acts on testicle substance, as likewise the blood of a woman with a male fetus in the uterus. They accept this as evidence of the physiologic passage of hormones from the fetus to the mother. An attempt at artificial fecundation was made in two women, all conditions apparently favorable. Tests of the women's blood the same and the next day failed to show any action on testicle substance. Absorbed sperma thus will not have a disturbing action on the serologic determination of the sex of the fetus in the uterus.

Injury of Child by Intra-Uterine Intervention.—Winter presents data to sustain his assertion that version and all other intra-uterine interventions have very serious consequences for the child, as they entail intra-uterine asphyxia which grows progressively graver the more severe the intervention and the more time has elapsed. The injury to the umbilical cord, to the placenta, and the irritation and shock to the fetus itself amply explain the disturbances. The conclusion from his research is the impressive warning, to postpone all intra-uterine interventions until the os is fully dilated, so that the extraction or delivery can follow at once.

Castration and Ovarian Deficit Phenomena.—Wolmershäuser analyzes 146 uterine myoma cases treated by irradiation (131) or myomectomy (15). The resulting deficit phenomena seem to occur in about the same proportion and intensity whatever the treatment. They seem to depend more on the woman's nervous and mental condition than on the mode of castration.

Münchener medizinische Wochenschrift, Munich

72: 1231-1278 (July 24) 1925

*The Mania in Asthenic Women for Operations. A. Krecke.—p. 1231.
Technic of Blood Transfusions. A. Beck.—p. 1232.
Tests for Resistance of Erythrocytes Against Osmosis and Alcohol. B. Spiethoff.—p. 1236.
Chemical Irritation in the Pathogenesis of Cancer. H. Burckhardt.—p. 1237.
*Symptoms of Pulmonary Embolism. K. Bingold.—p. 1237.
*The Dangers of Sinusitis and Its Treatment. G. Riedel.—p. 1239.
Case of Malignant Chordoma. K. Walz.—p. 1241.
*The Duodenum-Pylorus Reflex. Bársony and Egan.—p. 1242.
*Large Thyroid in School Children. Klein.—p. 1244.
Alimentary Disturbances in Bottle-Fed Infants. P. Widowitz.—p. 1245.
Acute Yellow Atrophy of the Liver. S. Büchner.—p. 1249.
Early Diagnosis of Appendicitis. Rapp.—p. 1250.
Treatment of Varicose Veins and Ulcers. Walter.—p. 1251.
Gastrophilus Haemorrhoidalis in a Woman. V. Liodt.—p. 1252.
Fractures of the Femur. F. Lange.—p. 1253. Cont'd.
Proposed Legislation on Abortion. Schiedermair.—p. 1256.
Bill for Financial Aid at Childbirth. Klotz.—p. 1257.
The Older Literature on Syphilis in Animals. P. Hildebrand.—p. 1257.
Recent Dermatologic Literature. J. K. Mayr.—p. 1261.

The Mania of Asthenic Women for Operations.—Krecke describes a type of asthenic women with relaxed abdominal musculature and more or less complete enteroptosis, who complain of chronic gastric pain, and who are frequently diagnosed as having a peptic ulcer. They urge the physician to operate, frequently several times, and are never relieved from their symptoms. They have no ulcer, and psychotherapy may often be more successful than operations for which there are no indications.

Symptomatology of Pulmonary Emboli.—Bingold emphasizes that postoperative and thrombophlebitic pulmonary emboli frequently do not display the symptomatology the textbooks teach. There may be only localized pains in the chest, followed by hemorrhagic sputum, or the formation of a pulmonary abscess. On the other hand, the patient may have pains and muscular rigidity in the right lower abdomen; ileus-like or appendicitic symptoms may entirely obscure the clinical picture of pulmonary embolism in the beginning.

Nasal Sinusitis.—Irrigation of the sinuses is never without danger, especially in acute processes. In case of fever, or when a fibrous exudate has formed, irrigation should not be performed. Riedel believes that operative treatment of the antrum frequently entails inflammation in the ethmoidal and frontal sinuses. The latter and the sphenoidal sinus should be operated on only when persistent headaches cannot be cured by an antrum operation and conservative treatment.

The Duodenum-Pylorus Reflex.—Bársony and Egan draw the following conclusions from their experimental and clinical work: Hydrochloric acid in amounts found under physiologic or pathologic conditions does not influence the tonicity, the peristalsis or the emptying time of the stomach, nor does it modify the pyloric mechanism. Amounts which exceed the amounts ever found in hyperacidity paralyze the gastric musculature, and delay or prevent the emptying process.

Large Thyroid in School Children.—Klein reports from Essen in the Rhineland the frequent occurrence of this condition. He believes that it is due to the general poor living conditions, and especially to the lack of iodin-containing vegetables in the food of the majority of the children.

Wiener klinische Wochenschrift, Vienna

38: 829-852 (July 23) 1925

Test for Iodin Action in Connection with Asthma. H. Pollitzer and E. Stolz.—p. 829.
*Treatment for Severe Burns. G. Riehl.—p. 833.
The Physical Elements in Cell Multiplication. F. Orthner.—p. 834.
The Determination of the Sugar Value in Food. W. Falta.—p. 838.
*The Bacteriophage in Treatment of Colon Bacillus Infections. B. Frisch.—p. 839.
The Cautery in the Treatment of Mastitis. A. Kameniczky.—p. 843.

Treatment of Severe Burns.—Riehl reports the case of a woman with severe burns, covering more than 40 per cent. of the body surface, whose life was apparently saved by blood

transfusion. In another similar case the same procedure resulted in a prolongation of life.

Treatment of Infections of the Urinary Tract with the Bacteriophage.—Frisch treated patients with chronic cystopyelitis with instillations of active bacteriophage cultures into the pelvis of the kidney. The results, even in very persistent cases, were very encouraging.

38: 853-876 (July 30) 1925

Newer Problems in Cancer Research. Bauer and Nyiri.—p. 853. Cont'd.
*The Etiology of Renal Amyloidosis. H. Beitzke.—p. 857.
*Malaria Treatment for General Paralysis. Jagić and Spengler.—p. 859.
Two Cases of Atypical Typhoid Fever. P. Ceranke.—p. 860.
A Liver Lobe Adherent to the Stomach. E. Schütz.—p. 863.
*Proliferation of Lymphatic and Myeloid Tissues. Robitschek.—p. 863.
Endocrines and Gastro-Intestinal Tract. F. Boenheim.—p. 867.
The Treatment of Typhoid. F. Kovács.—p. 867.

Chronic Amyloid Nephrosis.—A satisfactory explanation for the pathogenesis of amyloid nephrosis in patients, who do not suffer from a wasting or purulent disease, has not been established as yet. Beitzke reports three cases of this type. In two of them, he considers suppurating lesions of long standing—but which had healed long before the symptoms of the renal disease became manifest—as the causative factor. In the third case a recurring fibrinous pneumonia was probably the cause of the renal condition. It does not seem probable that a chronic nephritis will ever become transformed into amyloid degeneration of the kidney.

Syphilitic Aortitis and Malaria Treatment of Paralysis.—Jagić and Spengler state that patients with a syphilitic mesaortitis suffer no ill effects from the malaria treatment. In most cases they observed a considerable decrease in the blood pressure, and in patients who had symptoms of angina pectoris the symptoms were not infrequently relieved.

Proliferation of Lymphatic and Myeloid Tissues.—A man, 52 years of age, was admitted to the hospital with symptoms of motor aphasia and a hemiparesis. The skin and mucous membranes showed several hemorrhagic spots, the spleen was swollen, the temperature of septic type. The blood contained normoblasts, myelocytes, myeloblasts, and only 10 per cent. lymphocytes. The patient died four days after admission. The ileocecal valve was found transformed into a tumor mass, which resembled very much a lymphosarcoma, consisting of small lymphocytes only. The spleen, the liver, and the mesenteric lymph glands contained many small cellular infiltrations which consisted of myeloblasts and myelocytes. Robitschek believes that the myeloid granulations were caused by an infectious agent.

Zeitschrift für Geb. und Gynäkologie, Stuttgart

89: 1-210 (July 31) 1925

*The Acetone in the Blood in Pregnancy. Bokelmann et al—p. 1.
Operations for Myoma. B. Aschner.—p. 17.
*Bile Elements in the Blood During Pregnancy. G. Süsstrunk.—p. 49.
Physicochemical Conditions of Menstruation. A. Gengenbach.—p. 56.
*The Blood Uric Acid in Pregnancy. Bokelmann and Rother.—p. 72.
Episiotomy. F. C. van Tongeren.—p. 76.
Immunity Against Spermatozoa. Bodnár and Kamniker.—p. 85.
Interstitial Pregnancy. W. Schmitt.—p. 87.
Prolapse Operations and Delivery. E. Vogt.—p. 118.
Teleangiectases in the New-Born. M. Hagenbuch.—p. 127.
*Basal Metabolism During Menstruation. W. Lanz.—p. 133.
Ovarian Teratomas. R. Meyer.—p. 142.
Uncomplicated Transverse Presentation. Sachs and Poeck.—p. 145.
Physiology and Management of Third Stage of Labor. von Schubert.—p. 183.

Acetone in the Blood of Pregnant Women.—Bokelmann, Bock and Rother found that the acetone content of the blood is 43.5 per cent. higher during pregnancy than in normal nonpregnant women. During the second stage of labor the acetone rises still more, and reaches an average amount of 12 mg. per hundred cubic centimeters of blood; shortly after delivery, the actone returns to normal values.

Bile Products in the Blood During Pregnancy and Delivery.—Süsstrunk found in 35 per cent. of pregnant women an increase in the blood bilirubin; in 71 per cent. of the cases he found an increase during childbirth. The bilirubin content is especially high in women with eclampsia, but it does not parallel the amounts of biliary acids in the blood, and it does not seem to be influenced by renal disturbances.

Uric Acid in the Blood During Pregnancy and Delivery.—Bokelmann and Rother found in pregnant women rather low values, an average of 2.74 mg. per hundred cubic centimeters of blood and about the same amount at the beginning of childbirth. The uric acid may increase slightly after delivery. In eclampsia the uric acid is always considerably increased.

The Influence of Menstruation on the Basal Metabolism.—In healthy women menstruation frequently does not influence the basal metabolism, but Lanz found that in sick women the menstrual cycle exerts a definite influence on the metabolic rate. Toward the end of the interval and in the premenstrual period the rate increases; at the beginning of the menses it decreases quickly and it reaches the lowest value in the beginning of the interval. This cycle parallels the development of the corpus luteum.

Zeitschrift für Urologie, Leipzig

19: 561-640, 1925

Present Status of Treatment of Nephritis. L. Casper.—p. 565.
Gonococcus Infection in Men; Evidence of Cure. Balog.—p. 576.
Satisfactory Bladder Formed from Sigmoid Loop. P. Strassmann.—p. 583.
Regeneration of the Bladder After Excision. C. Ravasini.—p. 601.
*Diathermy in Complications of Gonorrhea. V. J. Marselos.—p. 604.
A Classification of Retention Tumors of the Kidney. B. Laqueur.—p. 610.

Diathermy in Treatment of Gonorrheal Epididymitis and Orchitis.—Diathermy treatment arrests pain almost immediately; it shortens the period of inflammation and it prevents spreading of the infection and the development of sterility. Marselos describes a special technic for this treatment.

Zentralblatt für Chirurgie, Leipzig

52: 1633-1696 (July 25) 1925

The Goiter Problem. Eggenberger.—p. 1634.
Transpleural Access to Subphrenic Abscess. E. Orsós.—p. 1637.
Improved Dovetail Technic for Osteosynthesis. Linberg.—p. 1640.
Plastic Mobilization of the Knee. W. Fickenwirth.—p. 1642.
Drainage of the Common Bile Duct. A. W. Wischnewsky.—p. 1644.
*Dangers of Periarterial Sympathectomy. A. Hilse.—p. 1645.
Improved Nail Extension. H. Degenhardt.—p. 1648.
Two Common Diagnostic Blunders in Accident Practice. Niedlich.—p. 1649.

Periarterial Sympathectomy.—If an infected process is present in the limb on which sympathectomy is to be performed, Hilse believes that the danger of infection of the operation wound and of the arterial wall is very great. Infected thrombi and severe hemorrhages may occur, and may make amputation imperative.

Zentralblatt für Gynäkologie, Leipzig

49: 1633-1696 (July 25) 1925

*Movements of Fallopian Tube. F. v. Mikulicz-Radecki.—p. 1655.
Hypertrophy of Uterine Mucosa Following Ovarian Tumors. R. Meyer.—p. 1662.
Transperitoneal Medication During the Third Stage. H. Bergmann.—p. 1667.
Ozone for Pneumoperitoneum. A. Schücking.—p. 1671.
Case of Prolapse-Inversion of the Uterus. H. Hirsch.—p. 1672.
Treatment of Postpartum Hemorrhage. Burger.—p. 1674.

Spontaneous Movements of the Fallopian Tubes.—Von Mikulicz-Radecki observed on virgin rabbits rhythmic contractions of the circular muscle fibers, with the general direction from the ovary to the uterus. Simultaneously there existed a pendulous movement, similar to that of the intestines. Peristalsis was absent.

Zentralblatt für innere Medizin, Leipzig

46: 689-720 (July 25) 1925

The Mechanism of Pathologic Changes in the Heart. G. Schaetz.—p. 690.
Fatal Perforation of Esophagus During Gastroscopy. A. Bingel.—p. 695.

46: 721-736 (Aug. 1) 1925

*The Excretion of Colloids in Diabetes. H. Pribram.—p. 721.
Historical Notes on Silica Therapy. G. Zickgraf.—p. 725.

Excretion of Colloids.—Pribram found that in diabetes the urine colloids are increased. Insulin treatment diminishes the foam-producing colloids, which Pribram considers to be chiefly protein cleavage products, and which may play an important rôle in the pathogenesis of the diabetic toxicosis.

Časopís lékařů českých, Prague

64: 1021-1048 (July 4) 1925

Roentgen Diagnosis of Benign Tumors of Stomach. Sigmund.—p. 1021.
Prevention and Treatment of Genital Prolapse. J. Trapl.—p. 1025.
*Blanching of Flour. G. Kabrhel.—p. 1029. Conc'n.
*Glanders. E. Zeman and V. Tomášek.—p. 1032. Conc'n.
*Tuberculous Cavities. J. Jedlička.—p. 1039.

Blanching of Flour.—Kabrhel advises prohibition of artificial blanching of flour with chlorin. It has an advantage only for the factory, and all the disadvantages for the consumer.

Glanders.—Zeman and Tomášek observed two cases of malleus in veterinary surgeons. The incubation period was six days in one, twenty-four days in the other. The general character of the infection was pyemic. Strauss' experiment, agglutination and complement fixation were negative in the first case. The serologic tests became positive in the other, before the inoculation of two guinea-pigs succeeded. In spite of the absence of tuberculosis, the serum from both patients gave a positive complement fixation with Boquet and Nègre's antigen.

Diagnosis and Curability of Tuberculous Cavities.—Jedlička reviews the chances of recovery with tuberculous cavities. He checked by a series of roentgen pictures the process of complete healing of a cavity. The shadow measured 5 by 4 cm.

Archiv Biologitcheskih Nauk, Moscow

24: 3-160, 1924. Partial Index

Mallein and Glanders. K. Kressling.—p. 3.
*Differentiation of Typhoid Bacilli. V. Ioffe.—p. 31.
*Bacteremia in Tuberculosis. K. Vvedensky.—p. 39.
*The Blood in Scabies. K. Tsvetkova.—p. 49.
Immunization with Fats. J. Lebedeva.—p. 57.
*Sulphatids of the Brain. A. Petrunkina.—p. 77.
Biochemistry of the Brain. P. Astanin.—p. 87.
*Mucus of the Stomach. M. Brestkin and K. Bykoff.—p. 97.

Differentiation of Bacilli of Typhoid Group.—Ioffe uses different milk agar mediums for cultures. One culture was made on milk agar; another in peptone agar mixed with the mineral or organic salts of milk, while meat peptone agar was used for the control culture. Growth of bacilli, occurring within eighteen hours, but only in the meat peptone control tube, reveals the typhoid bacillus. Growth in the control tube and also in that with peptone agar and milk salts, indicates the paratyphoid bacillus A, while bacterial growth in all three tubes is characteristic for the paratyphoid bacillus B. He uses 2 per cent. agar; 1 per cent. peptone, and 0.5 per cent. sodium chlorid. The 0.15 per cent. of sodium citrate (organic salt of milk) seems to be what prevents the growth of the typhoid bacillus.

Significance of Bacteremia in Surgical Tuberculosis.—On the basis of the literature and personal research in 150 cases, Vvedensky concludes that the presence of tubercle bacilli in the blood, with surgical tuberculosis, does not depend on the localization of the affection. The blood (treated with an alkaline solution of sodium hypochlorite) shows the bacilli in from 60 to 82 per cent. of cases of surgical tuberculosis without an active process in the lung. The presence of the bacilli in the blood is not significant in prognosis, since they may appear at any stage of the disease. Under subcutaneous injections of tuberculin they become more pronounced in the blood. Tubercle bacilli are never found in the blood of persons free from tuberculosis. Detection of the bacillus in the blood may help in the diagnosis of the tuberculosis.

Eosinophilia in Scabies.—Tsvetkova emphasizes that eosinophilia was pronounced in her forty-two patients with scabies, especially in the beginning of the disease.

The Sulphur in the Brain.—Petrunkina's research confirmed the presence of sulphur in the lipoids of the white as well as of the gray matter of the brain. The amount varies with the progress of autolysis after death. Alcohol or ether extracts of the brain, especially of the white matter, contain about 0.5 per cent. of sulphur. The instability of the sulphatids and the appearance of sulphuric acid in the cerebrospinal fluid may be significant in the biochemistry of the brain.

Rôle of Gastric Mucus in Digestion.—The results of Brestkin and Bykoff's study demonstrated that the gastric mucus is an active factor in digestion. The mucus obtained outside of digestion as well as during food, mechanical or chemical irritation, contains a concentrated ferment which passes into and acts on the food substances. Digestion in test tubes, with and without mucus, always proceeded much more vigorously in the mucus tubes.

Hygiea, Stockholm

87: 417-448 (June 15) 1925

*Toxic Goiter. A. Troell.—p. 417.
History of Medicine in Japan. J. Almkvist.—p. 436. Conc'n.
Recent Works on Iodin Prophylaxis of Goiter. A. Josefson.—p. 445.

Operative Treatment of Toxic Goiter.—Troell relates that all were much improved or cured of his forty-nine patients that survived the operation on the thyroid for toxic goiter; seven died in connection with the operation under general anesthesia. The best results may be anticipated, he says, with toxic adenoma of the thyroid. With diffuse toxic goiter, if the basal metabolism is increasing, an operation should not be delayed too long, but it must not be too radical at first.

87: 497-528 (July 15) 1925

*Case of Bothriocephalus Anemia. A. Grönberg.—p. 497.
Case of Right Anterior Pleuritis. A. Grönberg.—p. 504.

Bothriocephalus Anemia.—The parasite had caused merely negligible symptoms for twenty years. Then anemia of the pernicious type developed abruptly and became very grave after a herniotomy and hydrocele operation. The almost moribund patient recuperated under transfusion of blood, allowing measures to expel the tapeworm, after which the blood returned rapidly to normal range. The eosinophils never surpassed .3 per cent., and the urobilin excretion was peculiar.

Norsk Magazin for Lægevidenskaben, Oslo

86: 637-756 (July) 1925

Medicine in Norway in the Fourteenth Century. I. Reichborn-Kjennerud.—p. 637.
*Pregnancy Nephritis. S. Kjelland Mørdre.—p. 654.
*Treatment of Gap in the Urethra. S. Widerøe.—p. 682.
*Tetany and Rickets. L. Salomonsen.—p. 685.
Erythema Nodosum. K. Moe.—p. 696.
Some Cases of Amebic Dysentery. J. A. Voss.—p. 703.
*Sarcoma at Site of Osteomyelitis. F. Harbitz.—p. 708.

The Ambard Urea Excretion Coefficient.—Mørdre discusses the Ambard index in relation to pregnancy kidney. The findings and other data are tabulated from sixteen persons with apparently sound kidneys, thirty with various forms of kidney disease, and 125 with pregnancy kidney. The higher Ambard coefficient in the pregnancy kidney cases is due to functional disturbances in the acute cases, sustaining the assumption of vascular spasm in the kidneys. There is usually hypertension in these cases. The Ambard index shows that pregnancy nephritis includes cases of normal kidney functioning and of actual nephritis, with all their intermediate stages.

Ekehorn's Method of Closing a Defect in the Urethra.—Wilderøe reports two cases, emphasizing the advantages of this method. The suspensory ligament of the penis is reached and mobilized through an incision above the symphysis. This allows the stumps of the urethra to be brought in contact, with no strain on the suture. The position of the penis thereafter is somewhat altered.

Tetany and Rickets.—Salomonsen reports four cases which confirm that the real instability of the calcium content of the blood, which characterizes tetany, disappears when cod liver oil is given. Even intercurrent fever does not then modify the calcium content of the blood. He mentions further the constant increase in the phosphorus content of the blood as rickets is subsiding. The curves in four cases show the parallel rise in calcium and phosphorus.

Sarcoma in Connection with Chronic Disease.—Harbitz gives illustrations of a case in which a sarcoma developed at the site of an acute suppurating osteomyelitis, following a trauma, in a boy of 13. In another case, the sarcoma developed in the stump after amputation of the arm, for chronic osteomyelitis, in a man of 70. He accepts a probable causal connection with the trauma in both instances.